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   by *Dr. V. C. Kulandiswamy,*
   Director of Technical Education, Tamil Nadu
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EDITORIAL—SOME HIGHLIGHTS

I General Economic Scene

State:

Monsoon and Prices: November saw an intensification of the North East Monsoon in the State. There was wide spread and heavy rains all over the State and the dry districts of Ramanathapuram, Dharmapuri, Tirunelveli and parts of Coimbatore received for the first time in three years adequate rains. Madras and Chingleput had their heaviest rains of the century in the latter part of November and all lakes and tanks in the 2 districts were overflowing and to prevent their breaking their bunds water was let out in the Cooum, Adyar, Buckingham Canal causing floods in the locality and serious dislocation to those with houses on their banks. In Coimbatore district wide spread rains resulted in floods and irrigation tanks and ponds in Avinashi and Tirupur areas were filled and rivers overflowing. In Tirunelveli district, the Tambaraparani was in spate and the water levels in the Papanasam reservoir and the Papanasam dams rose substantially. The Papanasam reservoir's four lower channels were opened for Pishanam cultivation from mid November. In Madurai, the drinking water problem has been solved and water from the Vaigai dam for the ayacuts in Madurai and Ramanathapuram districts released from November 19. In Thanjavur, the continuing rains affected 50 per cent of the kuruvai harvest under way in November but were of considerable help for the samba crop. The Mettur reservoir received fresh flows and the level at November 24 was 13.94 metres. Madras city as noted earlier was severly affected by floods caused by the rains and the opening up of the Chambarapakkam and other lakes, displacing 3 lakh persons. The government, the University and other bodies are engaged in a large scale relief and rehabilitation operations for the displaced peoples. On the price front, 50,000 tonnes of Andhra rice moved into the State and became available not only in Madras but also in Tiruchirapalli, Thanjavur and other interior towns, resulting in a fall in the price of rice by 15 to 30 paise per kg. all over the State in Madras, Coimbatore, Virudhunagar, Tirunelveli, Salem, Kanyakumari etc. The supply of edible oils improved in November, following the issue of the Tamil Nadu Groundnut and Groundnut Oil (Declaration of Stocks by Agriculturalists) Order 1976 on November 14 requiring every agriculturalist to declare his stocks in excess of 5 quintals of unshelled groundnuts or 3.5 quintals of groundnut kernels or 1.5 quintals of groundnut oil. The

prices declined to Rs. 168 per quintal for unshelled groundnut, Rs. 240 per quintal for groundnut kernel and Rs. 540 per quintal for groundnut oil. CSO's August 1976 report shows a certain stabilisation of wholesale prices for the State for May at 273 general, 271 for food and 314 for clothing. Rural prices which were 274 for May moved down to 270 for June, though food prices at 282 were above the general food prices index for the State, showing the non-operation of the public distribution system in the rural areas. Inter city prices moved favourably for the mofussil centres, Madras being 287 while Madurai was 271 and Tiruchirapalli 268.

Power: In November the power position in the State continued with the 25 per cent cut imposed in July (see Vol VI p 439). The storage in the hydel reservoirs improved slightly as a result of the November rains, but more to promote the growth of small industry, the goverment announced at the end of November the reduction in the power cut on all small industries from 30 to 15 per cent. Also in November the government set up the Tamil Nadu Electricity Consultative Council comprising the members of Tamil Nadu Electricity Board and 17 other members representing local self-government, electricity supply industry, chambers of commerce, SIMA, Cement, Railways, Co-operatives and Harijan Welfare to advise the Board on the management of electricity generation and distribution. Kerala will be commissioning the third 130 MW unit in Idukki in December and supply Tamil Nadu its surplus power. Power generation at Ennore had to be reduced from 275 MW to 100 MW for five days from November 24 because of the flooding of the coal conveyor tunnel which followed the heavy rains referred to earlier. The Basin Bridge Thermal Station (90 MW) was also closed. On the 28th both stations resumed power generation in full and supply from 8 out of 9 sub-stations and 386 out of 450 distribution transformers affected during the floods was resumed.

For the country as a whole, the Lok Sabha on November 1 passed the amendment to the Electricity (supply) Act of 1948 replacing the ordinance to that effect whereby the Union and State governments are empowered individually or jointly to establish and operate power stations and allocate functions and duties in relation to the generation and supply of electricity between generating companies and the State Electricity Boards. This is the base for the evolution of a national power policy. Power stations in the country generated a record of 262.63 million kwh power on October 30, reducing the total daily shortfall to 3.57 million kwh. For November, the shortfall is 11.64 million kwh per day, due to the early withdrawal of the monsoon and the consequent higher irrigation load. Between April and September total power production increased by 16 per cent, with nuclear power stations registering an increase of 21.28 per cent. In 12 States there were no power cuts, but in seven States, Uttar Pradesh, Madhya Pradesh, Maharashtra, Goa, Karnataka, Tamil Nadu and West Bengal cuts ranged from 5 to 40 per cent. Inter State relief was provided, Gujarat to Maharashtra 48 million kwh, Kerala to Tamil Nadu 68 million kwh, Tamil Nadu to Karnataka 30 million kwh and Rajasthan to Bihar 7 million kwh. In November Maharashtra increased its cut from 10 to 30 per cent to 15 to 40 per cent. To meet this countrywide short power supply situation, REC is working on alternative sources of

energy. It approved the setting up of a community biogas plant in Kudumunza in the Karimnagar district. On the basis of a feasibility report proposed by a CSIR scientist, the construction operation and maintenance of the plant is being undertaken by the REC society in Karimnagar at a cost of Rs. one lakh available from the remission of interest payments granted to it by REC. The project will meet the biogas needs of 60 families, two hours in the morning and two hours in the evening at a household charge of Rs. 12 to Rs. 18 per month. In addition the plant will supply enriched sludge as a by product to the farmers. This project is of interest to all the backward districts which have been chosen under the programme of integrated Rural Development as one means of meeting their power supply needs.

Cauvery: The Cauvery panel (see Vol VI p 634) with Mr. Saldhana as Chairman met at the end of October in New Delhi and again at the end of November to discuss and agree upon the sharing of Cauvery waters. At the October meeting questions on the sharing principles were raised by Kerala and at the November meeting in Cochin agreement was reached on the principles for sharing the waters among the 3 States. This is now being translated into precise quantitative shares for which formats have been established which after agreement will be the basis for the operation of the Cauvery valley Authority.

Fiscal and Administrative Regulations: A further amendment to the Tamil Nadu General Sales Tax Act 1976 was issued on November 9 under which the tax rate on cereals is fixed at one per cent at the point of first sale in the State and 4 per cent at the point of first sale in the State for crude oil and pulses. The exemption from sales tax of cereals, wheat, paddy, rice etc. continues. This follows the amendment to the Central Sales Tax Act 1976 and will help both consumers and commodity movements into the State. Also in November, the President suspended the enforcement of Article 31 of the Constitution which deals with the right to property, in relation to any action taken by the Government under the Tamil Nadu Urban Land (Ceiling and Regulation) Act 1976. This Act's enforcement thus will no longer be the subject of review in any court of law. Also the Co-operative Societies Act is being reviewed by the government to amend it to improve the functioning of the societies and weed out undesirable elements from it. The society is opening 125 new co-operative societies in the rural areas of Chingleput and North Arcot districts, in addition to the 232 societies already set up in rural areas. On the administrative side, the government has set up a new department of Personnel and Administrative Reforms for recruitment, appointment and all service matters of the secretariat, man-power planning, training and career development, vigilance and anti-corruption and research in personnel administration. Also in place of the Disciplinary Tribunals manned by judicial officers, the government has designated Commissioners and Deputy Commissioners for all disciplinary proceedings. The Commissioners will function from Madras, Madurai and Coimbatore to deal with corruption cases processed by the Vigilance Commission and all serious disciplinary cases, as a means of toning up the administration in the State.

Housing: To supplement the Rs. 4 crores loaned by LIC, the State government has authorised the State

Housing Board to borrow the additional Rs. 8 crores needed for its housing programme for EWS and LIG. RBI has authorised Nationalised Banks to lend upto 40 per cent for housing construction for economically weaker sections and low income groups. Againt the completion of the preparation of the master plan for water supply and drainage for the State which will not only revamp the water supply distribution system and rehabilitate the sewage system, but also correct distribution deficiencies, deal with disposal of industrial effluents and their recycling, and set up sewage treatment plants, the Tamil Nadu Water Supply and Drainage Board received in November a loan for Rs. 4.35 crores to finance 24 continuing water supply and sewage schemes and 34 new water supply schemes of 56 local bodies. The government also announced that it will be executing a project costing Rs. 19 crores with the help of the World Bank for slum improvement and clearance as part of the master plan to be operated by the Madras Metropolitan Development Authority. It involves provision of sites and services for 14,000 slum dwellers in Arumbakkam, Villivakkam and Kodingayur, for improving 24,000 people's slum sites and for rural industries and nutrition projects. Thus the government has now officially stated that in addition to the slum clearance programme, it will be operating a slum improvement scheme covering slums in Madras (504), Tiruchi (51), Madurai (92) and Coimbatore (47) to provide drinking water supply, public conveniences, and street lights at a cost of Rs. 5 crores. Also mobile co-operative stores are being started in Madras for supplying essential articles in the slum areas.

Transport : Of the 250 national bus permit allocated to the State, 222 have been granted. For the remaining 28 permits, 588 applications have been received by the government, showing the popularity of the scheme. The World Bank as part of its advisory service to the Madras Metropolitan Area Development Authority has suggested that for efficient and profitable road transport operation, transport permits should be based on "area of operation" and not on the criteria of "route system" as at present. The area wise operation, it is pointed out, will facilitate maximum utilization of the available fleet strength, eliminate uneconomical operations and cater to the needs of the travelling public. The Madras Corporation has launched a Rs. 40 lakh crash programme for the improvement of road platforms in the city, particularly the platforms for pedestrian traffic. In this connection educational institutions have been requested to care for their platform sections. For the lorry transport industry which has had to contend with too many check posts, heavy loans and increasing cost of spare parts the Southern Food Zone has been of considerable help in making real these inter-State transport permits. Madras port is starting work on a Rs. 6 crore dry dock project and a Rs. 7.5 crore 1,005 metres outer arm break water to increase its facilities. FCI is providing Rs. 2.5 crores for increasing storage of 45,000 tonnes of foodgrains in the harbour, in addition to the existing facilities for storing 50,000 tonnes. The iron-ore handling facility whose stacker scheme was inaugurated in November and the shipping facility that will be commissioned in February will handle 8,000 million tonnes a year at the rate of 8,000 tonnes an hour in place of the current 8,000 tonnes per day. The fisheries harbour will be ready by January 1978 to accommodate 50 trawlers and 150 boats, to be trebled by January 1979. Since

June 1976, 300 tonnes per hour of fertilisers are being handled, along with the bagging and stitching facilities. For 1975-76 the total traffic passing through the harbour was 8.2 million tonnes (7.9 million tonnes in 1974-75). In the first six months of 1976-77 the port had handled 6.5 lakh tonnes of foodgrains, and will be handling 2.2 million tonnes of iron-ore and one million tonnes of general cargo for the year. Through training and use of modern techniques, the output per man per shift has increased from 6.52 tonnes to 8.34 tonnes. The preberthing detention of fertiliser vessels has been eliminated, that of liner vessels reduced to 8 hours, and of foodgrains ships to 2 days. The ports 1975-76 accounts show a net operation surplus of Rs. 4.52 crores (Rs. 0.2 crores during the previous year), which after payments for depreciation, loan and interest charges, and reserves, left a net amount of Rs. 31 lakhs. To attract more general cargo for export, the port trust is working on a system of financial incentives and warfage concessions on specific items, as part of a scheme for an export cargo complex in Madras port. The complex will supply and rationalise export procedures, bring them under one authority and provide a counter for counter service.

Land Pattas: November was a month when there was mass distribution of land pattas and house site pattas in the State. In Vellore in 36 panchayats 10,180 land pattas and house site pattas were distributed, including those for 1,300 Harijans. In Thanjavur in addition to the 90,000 acres distributed to the landless poor, 35,000 acres are to be distributed and one lakh acres of fallow land distributed. Under the Kudiyiruppu Act, 1.85 lakh pattas were distributed. In Tiruchi 10,000 land site pattas to the houseless poor were distributed and in Coimbatore 13,257 house site pattas to the poor were distributed in 10 taluks.

Welfare: To improve the functioning of the resetting scheme for the repatriates from Sri Lanka, the Union government has asked all State governments to participate in it and not only Tamil Nadu and the Southern States as at present, as their repatriation and settlement is a national not a State responsibility.: The repatriates are first accommodated at Mandapam where the camp can hold 600 families and in addition a second camp for 400 families has been opened at Kotapattu in Tiruchirapalli district. The earlier Burma repatriates camp at Gummudipoondi is also being refurbished for the Sri Lanka repatriates The small trade loan to each family has been increased from Rs. 2,000 to Rs. 3,000, the 10 co-operative spinning mills are being expanded to employ 1,000 repatriate families and the Union government loans per family for investing in the equity of the mills have been increased from Rs. 10,000 to Rs. 15,000 per family, the Kanyakumari rubber plantation scheme is being expanded by 800 hectares to employ 333 additional repatriate families: and the Tamil Nadu State Farms Corporation is being provided Rs. 4 crores by ARC to provide employment to 1,300 repatriates. Two State Committees are at work in the general field of alcohol and racing. One Committee is enquiring into means of ensuring strict and better enforcemment of the dry law: the other is examining the social and economic effects of racing. Both committees will be submitting their reports in the first part of 1977 and should result in improvements in controls in both areas of illicit consumption of alcohol and the socially harmful effects in horse racing. One further development in

November. The State government set up a 12 member committee to advise the commissioner over the Hindu Religious and Charitable Endowments Department with regard to the proper maintenance of temples, adequate amenities to pilgrims, renovation and preservation of the temples etc. Apart from advising on the better discharge by the temples of their religious function, the committee will also advise on the preservation of the archeological and architectural wealth of the temples.

National :

Fifth Plan—Annual Plan : Work on the Fourth Year Annual Plan for 1977-78 has been started by the Union Planning Commission to develop the details for the revised Rs. 10,000 crores for the Fourth year set forth in the finalised Fifth Plan. The Annual Plans of the States are to continue emphasis on the core industries, full utilisation of capacities and provide outlays for ongoing projects as well as to make proposals for new projects and schemes for which feasibility studies are to be attached. The Plans are to be submitted before the end of the year by both the Union ministries and the States. Mobilisation of resourses for the Fourth Annual Plan must meet the target of Rs. 900 crores for the Union government and Rs. 700 crores by the State governments for the the balance of the Fifth Plan, plus the high market borrowing of Rs. 1,947 crores for the remaining two years of the plan. For the Union government, selective taxation and revised product prices through rationalising the public sector pricing policies, and for the States increased agricultural taxes particularly through higher irrigation and electricity charges are envisaged. The allocation to the Railways has been finalised at Rs. 156.8 crores for the remaining two years as a means of ensuring full production in the 3 units to produce more locomotives, wagons and coaches. The Union government also announced in November that during the current year, it allocated Rs. 2.89 crores of additional Plan assistance in the form of grants (Rs. 10.04 crores) and loans (Rs. 2.48 crores) to seven States—West Bengal, Kerala, Assam, Tamil Nadu, Punjab, Tirupura and Delhi—to meet the emergencies they faced from floods and droughts.

Prices and Anti-inflation : The wholesale price index for October 1976 registered a slowly rising trend from 311.4 at October 2 as noted in the last issue (Vol. VI, pp 636-637) 312.7 at October 9, 313.3 at October 16, 313.6 at October 23 and a decline to 309.9 at October 30. The decline in the last week was due to a 2 per cent fall in food prices particularly bajra, groundnut and gur, a decline in raw tobacco prices by 3 per cent and a steep 18 per cent fall in groundnuts, while other items recorded a marginal rise or no movement. The Economic Time's retail price index for greater Bombay also showed a 0.6 per cent rise for October over September, and for April to October 1976 a rise of 8.8 per cent. Prices of cereals increased by 1.8 per cent, oils by 1.3 per cent, milk, fish and eggs by 0.6 per cent, and vegetables, fruits and sugar by 0.4 to 0.5 per cent, while other items declined marginally. For the period April to October, the wholesale price rise for the country has been of the order of 10.1 per cent due to (a) the rise in money supply during this period of 8.7 per cent compared to the 4.2 per cent increase in the corresponding period of last year, (b) the slow down in the public distribution system as seen in the decline in the offtake of foodgrains and other

essential commodities and (c) some speculative actions in regard to cotton, oil seeds, vegetable oils and sugar. Against this background, the Union government announced that work was under way on a national wage policy, starting with guidelines for public sector wage revisions, holding down the already high wages in LIC and nationalised banks and the use of the growing foreign exchange reserves to import edible oils and cotton as noted in earlier issues (see Vol. VI, p 621). The national plan for edible oils aims at increased production, better extraction, proper apportionment, equitable and systematic distribution and a phased programme of imports and regulated exports. The bumper groundnut crop of 70 lakh tonnes in 1975-76 is likely to be repeated this year which should lead to increased edible oils extraction. Similar plans are being made for other goods of mass consumption—cereals, pulses, sugar and standard cloth. The Union government also announced on November 11 support price for groundnut (Rs. 140 per quintal) and sunflower seeds (Rs. 150 per quintal), using the National Agricultural Co-operative Marketing Federation (NAFED) with an outlay of Rs. 45-50 crores for conducting the support price operations in edible oils. 50,000 tonnes of groundnut are to be exported this year and the income will be used to import other oils needed by the vanaspathi industry. The government and RBI also undertook a review of the expanding money supply referred to earlier. In the first 2 weeks of October money supply increased by Rs. 340 crores and the total bank credit upto October 8 for the financial year was Rs. 1,335 crores compared to Rs. 485 crores in the corresponding period of the previous year. This increased credit was about' equally divided between food credit (Rs. 674 crores) and non-food credit (Rs. 661 crores). Hence RBI announced that from November 13, with a view to regulating the lendable resources of the commercial banks, their cash reserves will be increased from 5 to 6 per cent of their demand and time liabilities. This means that the minimum cash and liquidity requirements of banks will increase ftom 38 to 39 per cent of their time and demand liabilities. They will receive a 5.5 per cent interest on their additional impounded reserves amounting to Rs. 100 crores. More generally RBI has called on all banks to observe greater credit discipline, to limit their lending to minimum production needs and to bear in mind RBI's rediscount facilities will be limited and selective. With regard to the increased resources available in the rural areas in the hands of rich and well to do farmers, RBI announced in November a modified scheme for the issue of rural debentures by approved State sponsored bodies, such as State Electricity Board, Agro Industries Corporations, Housing Boards (rural housing) and Co-operative Marketing and Processing Societies. The rate of interest for the rural debentures will be 12 per cent, payable half yearly with a maturity period of 10 years. To gain local support, the proceeds of the debentures are to be applied for productive schemes in the local areas. To ensure that the debentures tap individual savings, companies, commercial banks, L.I.C., provident funds, co-operative and other financial institutions cannot subscribe to the debentures but only individuals, including two or more jointly, with transferability limited to individuals. Debentures will enjoy the present tax concession. If pushed energetically, and planned wisely, this could be means of mobilising a part of the Rs. 2,000 crores of rural resources, resulting from last year's bumper harvest.

Industry and Public Sector Perfor-

mance: For the eight months, January to August, the index of industrial production recorded a rise of 13.2 per cent compared to the first 8 months of 1975. However compared to March, 138.2 per cent and July, 132.8 per cent, August recorded 130.4 per cent. In part this decline is seasonal, (August is a slack month), but more seriously the result of the power cuts in the seven States referred to earlier and the large scale labour retrenchments in certain industrial sectors. Whether the financial year will result in an 11-13 per cent industrial growth is now doubtful. The Union government announced two decisions in November to step up industrial production. 5 industries—jute, textile, engineering, cement and sugar—will be eligible for concessional financing for modernisation of their plant and machinery under the "soft window" section of IDBI from which about Rs. 200 crores will be available to them annually. The five selected industries have a large number of units needing modernisation, they produce mass consumption goods, they have a high employment and export potential and they are agro based. The soft loans are at 7.5 per cent interest, maturing in 12 to 15 years, with a 3 year grace period in needed cases. Using this resource, the industries should overcome their backlog in plant and machinery replacement and modernisation and attain more economical and higher production levels. They will also have bill rediscounting facilities at 15 per cent interest and in the case of jute industries at 11 per cent. The other decision of the government which will improve industrial production, is the announcement in November to place imports of permissible spare parts under the open general license system. With the earlier liberalisation of machinery imports and simplified procedure by DGTD units for capital goods, this should lead to a noticeable improvement in industrial production. If to this is added a policy of buffer stocks of industrial raw materials and spares, the record of industrial production should show an increase in the coming years. The Union government reports that in the 6 months, April-September, it has approved 148 collaboration agreements, 25 agreements involving financial participation and the remaining 123 for technical collaboration only. The products cover impulse burners, reactor coolant, pump metres, batching plants, paper mill machinery, high speed data acquisition and control systems, special refractories and electro-magnetic instrument etc. During 1975, the total foreign investments were Rs. 320.53 lakhs and from January to March 1976 was Rs. 61.27 lakhs. The public sector units continued to perform well. In October they produced Rs. 54.72 crores, which was 83 per cent of the month's target, with those under the Industry ministry registering 98 per cent. For the seven months, April to October, their performance recorded a 9 per cent increase over the same period of the previous year, varying between 83 to 97 per cent of the targets. BHEL at Rs. 28.76 crores in October was 81 per cent of the target, HEC at Rs. 6.67 crores was 77 per cent, Bharat Heavy Plates at Rs. 1.95 crores was 103 per cent, MAMC at Rs. 2.18 crores was 99 per cent of the target, Triveni structurals at Rs. 6.61 crores was 101 per cent, Bharat Pumps at Rs. 0.65 crores was 86.7 per cent, HMT at Rs. 5.87 crores was 83 per cent and Richardson and Crudas at Rs. 0.93 crores was 125 of the target for the month. Other outstanding units were Hindustan Paper, Bharat Opthalmic and National Instruments.

National Production Front:

Steel: In November, Hindustan Steel was split into 4 autonomous units—Bhilai Ispat Limited, with Rs. 500 crores authorised capital, Rourkela Ispat Limited with Rs. 300 crores authorised capital, Durgapur Misra Ispat Limited with Rs.100 crores authorised capital and Hindustan Steel at Durgapur with a share capital of Rs. 750 crores to be reduced to Rs. 300 crores later. Each company will have a separate Board of Directors, a whole time managing Director, with SAIL being the co-ordinating agency, the holding company, specialising in common R and D. This is a good and sound managerial decision and will make for more effective and efficient production. For 1975-76 Hindustan Steel's total profit amounted to Rs. 44.66 crores, of which Rourkela's was Rs. 28.33 crores, Bhilai at Rs. 28.22 crores and Durgapur alloy at Rs. 3.98 crores. Durgapur Steel lost Rs. 20.06 crores, its accumulated losses amounting to Rs. 150 crores. SAIL's R and D produced high strength alloy at Rourkela saving Rs. 5 crores per annum in foreign exchange, and the computerised controller unit at Bhilai saving Rs. 20 lakhs a year in foreign exchange. The aggregate production form the integrated steel plants for October used 93 per cent of capacity and performed at 104 per cent of the month's target. Total saleable steel production was 5.81 lakh tonnes in October compared to 5.73 lakh tonnes in September. Rourkela, Bhilai and TISCO exceeded their rated capacities. During the first seven months or the current year, total saleable steel production was 38.91 lakh tonnes—a growth of 24.4 per cent over the same period last year. SAIL also reports a tight financial situation in November due to heavy accumulation of stocks. Rs. 150 crores are locked up in steel stocks standing at a high level of 1.3 million tonnes. In particular Durgapur steel faces a low order for its fish plates and wheel sales. The splitting of HSL reported earlier will involve a higher tax liability of Rs. 30 crores for SAIL. The growing steel stocks is leading to increased exports which at October stood at 1.4 million tonnes against a target for the year of 2.5 million tonnes of Rs. 300 crores. Another proposal under study is the building of a buffer stock of one million tonnes of steel—which is of doubtful soundness when what is needed is stimulation of demand, by getting the Railways to step up its orders and allowing building construction to start up again.

Crude: With OPEC's discussions and near agreement of a rise in crude prices which might be of the order of 20 per cent, an increase in the domestic production of crude becomes a major priority for the country. In November the government announced oil finds in Damulgaon in Assam and Borhola in Nagaland and ONGC plans to increase Bombay High production from 80,000 barrels a day currently to 4 million tonnes by 1978 December. The plan also includes supply of one million cubic meter of gas per day for the Tromby fertiliser plant. This gas will be used for producing fertilisers and chemicals besides improving the position of liquid gas. ONGC also states that the country's onshore oil potential by next year would be 6.5 million tonnes per annum, which is an increase of 10 per cent per annum over the previous year's level—that is against 4 million tonnes production in 1974 and 5.2 million tonnes in 1975-76. On the basis of additional fields being developed in Gujarat and the Eastern region, the Western region will produce

4 million tonnes per year and the Eastern region 5 million tonnes. The Haldia Refinery processing is being increased from the current 1.5 million tonnes to 1.8 million tonnes in January 1977 against an installed capacity of 2.5 million tonnes. The government also is negotiating with a number of foreign oil companies, including foreign oil companies majors for processing crude on their behalf for a stipulated fee. The country's refineries have a refining capacity of 26 million while the throughput is only 22 million, thus leaving a surplus capacity of 4 million tonnes which is being hired out. This will also add to foreign exchange earnings of the country. This is a long term potential for with the setting up of the million tonne refinery at Bangaigaon, the 6 million tonne plant at Mathura and the Koyali expansion, the refining capacity will reach 37 million tonnes by 1980-81 at which time, according to the Fifth Plan document, the country's demand for crude will be 29 million tonnes. On the other hand there are a number of oil companies in the Gulf area who do not have their own refineries and who are looking for diversified refinery sources apart from Singapore and South Korea. To further increase offshore supplies, the government is replacing the product sharing contracts with foreign firms who in 2 cases gave up work after drilling 2 unproductive wells in the Bengal, Orissa and Kutch basins, by service contracts with foreign companies for development of oil, while retaining full ownership of the offshore oil fields and the oil produced. A first agreement on these lines is being concluded with the Norwegian government which will supply production platforms, undertake seismic surveys and drilling work and process the data, similar to the service contract entered with the French firm CTF. UK firms also are interested in such umbrella agreements, under which the best technology can be obtained and used *without sharing the oil produced.* The improved foreign exchange position also has helped the government to move in this direction. Meanwhile in view of the rising oil prices—with further large rises in the offing—the government has made advance purchase of 3.5 million tonnes of Iranian crude and is negotiating with Iraq. Already Rs. 30 crores have been saved by this action. Also India will be importing 1.4 million tonnes of petroleum products from USSR in 1977, including Kerosene (8 lakh tonnes) and HSD (6 lakh tonnes). Since the payment will be made in Rupees, there will be a foreign exchange saving of Rs. 150 crores. The government has from September increased the price of indigenous crude from Rs. 28.64 per barrel to Rs. 33.30 per barrel, following the increase in the royalty of onshore crude raised from 15 to Rs. 42 per tonne (see Vol VI p 576). Bombay High prices have not been fixed but are likely to be higher because of higher costs, though even so it will be lower than the price of imported crude. ONGC reports one setback — that of Jaisalmer in Rajasthan (see Vol VI p 639) where the earlier estimate of a large find has been given up — though exploratory drilling is continuing at deeper levels for more limited supplies. Another unimpressive result is the switchover from oil to coal as against the original target for such switchover set by the furnace oil committee (see Vol VI p 262). In the last 2 years 6.22 lakh tonnes of fuel oil were saved, of which thermal stations saved 5.45 lakh tonnes and the industrial sector only 77,000 tonnes. The latter should speed up the change over, and for this banks and term lending institutions should finance the coal firing equipment and the needed modifications. In the 2 years, Rs. 12.24 crores only have been

saved and this should be doubled this year. In November the takeover of Caltex Oil Refining (India) and Caltex (India)—see Vol VI p 640 was finalised and the actual takeover will be on December 30, 1976 at a cost of Rs. 13 crores. This means that out of the total 27.40 million tonnes of refining capacity, the public sector will own 26.9 million tonnes (only Assam Oil is left).

Coal : The total output of Coal India for the first six months—April-September—was 41.71 million tonnes against last year's first six months 40.75 million tonnes. This means that this year's production target 108 million tonnes will be reached. This raises two questions. First is the question of making realistic estimates of demand for coal so that the industry has a firm base for capitalisation and planning. The Fuel Policy Committee's estimate of 109 million tonnes for 1975-76 must be compared with the actual demand of 92.5 million tonnes and its forecast of demand of 140 million tonnes if maximum substitution of oil by coal achieved, with a minimum of 135 million tonnes and an intermediate level of 141 million tonnes for 1978-79, while the government fixed a lower limit of 135 million tonnes and the Planning Commission's further scaling it down to 124 million tonnes. For 1983-84 the Fuel Policy Committee's estimate is 200 million tonnes and there are suggestions to scale it down to 180 million tonnes. These varied and varying demand estimates affect the investment programme of the industry. The second immediate issue is that with domestic consumption not keeping pace with increase production, the government has increased this year's export target from 1.5 million tonnes to 1.9 million tonnes, which MMTC feels will be achieved as, apart from the traditional customers—Sri Lanka and Bangla Desh—France, Belgium, West Germany, Holland, UK and Japan are opening up as markets.

Ore and Non-ferrous Metals: The private sector in the iron-ore sector is facing two problems. First MMTC's price has not been negotiated at April 1976 when it fell due, and the low price of Rs.26.20 per tonne is compared with the prices of $ 15.48 to $ 17.76 per tonne at which it is being sold to Japan. A second problem is that while the Barajamda mines in Bihar and Orissa have invested and raised their output capacity to 3.5 million tonnes, MMTC has imposed a cut of 30 per cent on its traditional offtake of 1.9 million tonnes from both Barajamda and Bellary-Hospet mines for the current year, due to the decline forecast in the foreign demand. In the case of Barajamda mines this amounts to a 60-70 cut. There is need for a review of the private sector programme on both these counts. The total ore production in 1975 was 40 million tonnes, of which 22 million tonnes were exported at a unit cost of Rs.92.22 per tonne. In 1974, the 24 iron-ore producing countries produced 857 million tonnes valued at $11 billion, second only to world crude oil production and its value. The Association of Iron-ore producing countries (see Vol V p 592), with a total production of over 700 million tonnes, is negotiating an increase in world ore price commensurate with the rise in steel price. In regard to zinc, the expended unit of the Debari Zinc Smelter in Rajasthan was fired at the end of October, increasing its production to 40,000 tonnes per annum and enabling Hindustan Zinc to exploit fully the Zawara area deposits of zinc and lead.

Small Industry: During November, two issues marked the development small industries in the country. The power cut

in seven States referred to earlier affected them particularly. Tamil Nadu granted them relief from November. In Delhi, the Wazirpur complex was without power for several days in November due to non-payment of dues. 3,000 workers became idle and a loss of Rs.90,000 was incurred in the 102 small units. To increase the production capacity of small units, the government in November granted them import licenses for raw materials and components upto the value of Rs.50,000 in free foreign exchange and 70 per cent for amounts exceeding Rs. 50,000. Also the deadline for grant of licenses has been extended and procedures streamlined.

Sugar and Textiles: Sugar production in September which is the last month of the 1975-76 seasons, was 19,000 tonnes, making the total production for the year at 42,62,000 tonnes against 47,92,000 tonnes in 1974-75—a decline of 5 lakh tonnes for the year. The total despatches for 1975-76 was 36,65,000 tonnes for internal consumption and 9,67,000 tonnes for export, leaving a closing stock of 8,37,000 tonnes. As noted earlier a soft loan scheme for the modernisation of old but viable sugar units in order to meet the domestic demand of 52 lakh tonnes and 5 lakh tonnes for export and buffer stock at the end of the Fifth Plan is underway. This would raise licensed capacity to 70 lakh tonnes. On the textiles front, NCDE has launched two central sector schemes for establishing new textile mills and expand existing ones. 40 spinning mills are to be set up in the Fifth Plan in backward areas and in the co-operative sector and half a million spindles are to be added to the existing 76 co-operative units. The Reserve Bank has constituted a consortium of public sector banks to finance CCI's cotton purchases on behalf of NTC mills and for cotton imports to check price increases. Rs. 40 crores will be available to CCI for cotton purchase and of the 35 lakh bales of cotton to be imported at a cost of Rs 150 crores Rs. 125 crores will be from the banks.

Jute, Paper and Cement: The jute industry in November reports large inventories of unsold goods, leading to distress sales. The question of relief from the multi-point sales tax as a means of reducing gross costs of the mills has been raised. Meanwhile RBI has raised the credit limit of the Jute Corporation of India from Rs. 24 crores to Rs. 37 crores to enable it to increase its price support operations in view of the depressed conditions in the raw jute markets. In the paper sector, the government withdrew in November the concession granted in September to the paper industry to sell white printing paper in the open market, in view of the increased offtake of the white printing paper by educational authorities. Paper mills have to produce 30 per cent of their total output as white printing paper, which amounts to 2,00,000 tonnes. The industry claims that both government and educational authorities demand amount to 1,60,000 tonnes leaving a surplus of 40,000 tonnes. This can be verified in the coming months, and if true action can be taken to reduce the compulsory percentage imposed on the mills. On the cement front, while the current year's production is likely to be 18 million tonnes as against last year's 15 million tonnes, it will be short of the target of 20 million tonnes. Production in September was 13.84 lakh tonnes, a steep decline compared to May's 16.04 lakh tonnes. If this declining trend continues, there will be cement shortage this year. The decline in production is due to power cuts, lower government offtake and

the stand still in the building activity. For the first nine months of the current year, total production was 13.82 million tonnes—which in part accounts for the open market price being at the controlled price of Rs. 337.50 per tonne. With the decline in domestic demand from 60 to 40 per cent, government and private efforts to increase cement exports are under way. Here again exports should not be at the cost of domestic requirements which are being met, particularly in housing.

Agricultural Production : The Union ministry of Food and Agriculture forecasts a good kharif harvest—as good as that of last year. The government's plan is to provide additional irrigation to 10 lakh hectares every year through small, medium and large irrigation schemes. As a result of the record kharif and rabi crops in 1975-76, prospects of a similar kharif performance, imports and decline in the offtake from the public distribution system since October 1975, as at the end of September 1976, foodgrains stocks with the government, it was announced, was over 17 million tonnes. Chronically deficit States like West Bengal with a foodgrain requirement of 81.33 lakh tonnes per annum emerged for the first time as a rice surplus region, producing 86.02 lakh tonnes for the year 1975-76. The country's kharif procurement target is 4.4 million tonnes, but the government expects to exceed 5 million tonnes in procurement, on the basis of November market arrivals which were 50 per cent more. It also announced that its storage capacity will be 21.5 million tonnes by April 1977. The Union government programme for the intensive fertiliser use in 58 selected districts has not been too successful, because the scheme was started late in the kharif season and the implementation responsibility and accountability not clearly defined. The programme is being extended to cover the coming rabi season for which task forces are being set up to monitor the scheme. The 1976 report of the National Commission on Agriculture reviewed at an ICAR conference in New Delhi emphasises the modernisation on agriculture through application of science and technology. The report covers a 25 year period upto 2001, with an in between break at 1985—10 year period. It proposes that agricultural policy should lead to (a) adequate supply of goods and services to sustain a rising living standard and (b) sufficient employment and income opportunities for the masses which will generate effective demand for these goods and services. To this end, investment policies should generate demand supply balance in various agricultural commodities and maximum employment opportunities and aim at an integrated development of crop production, livestock and poultry, fisheries and forestry simultaneously. It suggests that in place of an all India nutritional norm for defining poverty, norms should be determined by population groups by States on the basis of local dietary habits, climate and average body weights. Mechanisation should be highly selective and should bridge the power gap in areas exhibiting a marked shortage in man and animal power Salient social justice measures suggested include creation of employment opportunities through diversification of agricultural activities, production of subsidiary occupations, development of secondary and tertiary sectors, land reforms and reorientation of the service structure to make technology scale neutral in practice. Estimates of per capita demand are made on high (5 per cent) and low (3 per cent) growth rate and population reaching 935 million in 2000 AD, and fertiliser supply increasing to 9

million tonnes in 1985 and 14 million tonnes in 2000. On this basis the demand supply balance for 2000 AD will be:

	Supply		Demand	
	Low	High	Low	High
Foodgrains (million tonnes)		230	205	225
Oils		9.7	8.3	10.2
Sugar and Gur	32.5	41.0	24.0	29.9
Cotton (million beles of 180 kgs.)	24.0	29.3	10.4	17.2
Jute and Mesta		16.7	8.6	11.8
Tobocco (thousand tonnes)		692	479	590
Milk (million tonnes)		64.40	49.4	64.4
Meat		2.10	1.57	2.11
Eggs (million nos)		27,882	17,419	28,513
Fish (million tonnes)		8.0	4.6	5.5
Industrial work (million tonnes)		7.1	4.7	64

The commission however warns that on the basis of pest trends, fertiliser offtake in 1985 may be only 6 million tonnes which will produce 153 million tonnes of foodgrains. To meet the low estimate demand of 150 million tonnes, fertiliser consumption will have to be 7 million tonnes and if the Draft Plan income target is realised, foodgrains demand in 1985 will be 163 million tonnes, to meet which fertiliser consumption will have to be 9 million tonnes to produce 164 million tonnes. On exports, diversification of commodities is suggested, particularly labour intensive crops and livestock products and markets along with integrated projects covering processing, packaging and actual shipment. In this connection there has been some suggestion to export foodgrains this year in order to avoid their spoilage and allow for further increases of 6 to 10 million tonnes from this year's procurement. Apart from the general issue of the undesirability of foodgrains exports by a country 40 per cent of whose people are living below the poverty line, about half the stocks should be used on the priority employment generating public works programme for the poor before any plan to export the foodgrains is seriously thought of. The commission report provides a detailed study of rain fall and cropping patterns at the taluk level of 62 rain fall regions and a balance sheet of land use at 1985 and 2000 which shows that net area sown and the gross cropped area will increase to 145 and 181 million hectares in 1985 and 150 and 200 million hectares in 2000. On animal husbandry improving the milk characterstic of cattle through cross breeding with exotic dairy bulls and by selective breeding and grading of buffaloes, increasing the cattle population from 168 million to 179 million along with measures to increase feeds and fodder are proposed. Introducing exotic

varieties, the sheep population should be increased from the present 40 million to 60 million by 2000, and veterenarians increased from the present one for 26,000 cattle to one for 5,000. Fish and shell fish can be increased from 1.9 million to 8.0 million tonnes - which will raise low cost protein food from 4 kg. per annum to 11 kgs, with 6.75 million tonnes consumed internally 0.25 million tonnes exported and one million tonnes used for fishery industry purposes. Inland fisheries should be increased from 5 kg. per hectare to 40 kg. by 2000. Forest policy should ensure first no reduction in the existing low forest area together with promoting social forestry, farm forestry and man-made forests. Its chapter on water resources shows 50 years as the time span for water development under the hydrological cycle of the country, so that by 2025, 110 million hectares would be irrigated out of a cropped area of 210 million hectares—half the total area instead of the present three fourths will be dry farming. Its recommendations on command areas, land formation, water channels, field drains and farm roads and consolidation of land holdings are detailed. It assesses credit needs of farmers for all purposes by 1985 to be Rs. 9,400 crores and recommends that commercial banks should increase their share of agricultural credit from the 1974 share of 8.8 per cent to 15 per cent by 1985 which together co operative credit can meet the credit needs of agriculture. Its recommendations on research fundamental, applied and adaptive by the agricultural universities, ICAR and State Departments, on primary agricultural education and extension education through one Farmer Training Centre for every 15 blocks are also well set out. It shows that the rural labour force will increase from 139 million in 1971 to 250 million in 2000. Agricultural programmes will generate 52 million man years employment, an increase of 60 per cent over 1971, two thirds from crop production, one fifth from animal husbandry and the rest from forestry and fisheries. 30 per cent of the rural labour force should be provided with non-agricultural rural employment in place of the present 15.5 per cent, which means creating 53.5 million man years of additional employment opportunities. It proposes that full employment will involve work for 265 days per year instead of 300 days. It also makes detailed recommendations on the reform of the agrarian structure through ensuring that agriculture is a family occupation and not a source of unearned income, making tenants the owners, forbidding leasing out lands except to marginal farmers, recognising share croppers as tenants, imposing ceilings on operational holding as well as ownership holdings, and consolidation of holdings in irrigated and command areas. Minimum wages legislation should move progressively towards incorporating social security provisions of provident funds, unemployment and sickness insurance for agricultural labourers. It is now for this far reaching report to be translated into policy and programmes.

Exports : During the first six months of the current financial year exports were Rs. 2,263.27 crores, compared to the first six months of 1975-76 of Rs. 1,764.59 crores, an increase of 28 per cent. Imports during the period were Rs. 2,250.68 crores compared to the previous year's six months Rs. 2,416.23 crores, giving a surplus trade balance of Rs 12.59 crores. It will be noted that the trade surplus has been declining from Rs. 70 crores in February and Rs. 95 crores in March (see Vol VI pp 448, and 501) With the increasing imports needed to

sustain the pick up in industrial growth and imports of edible oils, cotton etc to keep down consumer goods price rises, there is likely to be a trade deficit in the second half of the financial year. According to the final Fifth Plan document, imports during the Plan period is projected at Rs. 28,524 crores, the first two years recording Rs. 9,677 crores. This year it is likely to be around Rs. 4,838 crores, so that it is in the last 2 Plan years that imports will shoot up to something like Rs. 14,000 crores. It is for this reason that the Plan export target of Rs. 14,451 crores for the last 3 years of the Plan must be reached and the government has under consideration raising this year's target from Rs. 4,350 crores to Rs. 4,600 crores. Export during September increased by Rs. 12 crores to Rs. 388 crores and imports by Rs. 31 crores to Rs. 395 crores. The slow growth of imports with lower imports of fertilisers, foodgrains etc in the first 6 months led to a sharp increase in reserves which were Rs. 2,000 crores in June 1976 and Rs. 2,462 crores in August, being higher by Rs. 577 crores in March 1976 and Rs. 1,373 crores in August 1976. Monthly foreign remittances are running at Rs. 120 crores. Textile exports for the first six months were Rs. 159.29 crores (against last year's six months Rs. 71.01 crores) and may exceed the target of Rs. 400 crores, with garments and cloth doing particularly well. Silk exports increased by 7 per cent in October at Rs. 18.09 crores, with West Germany, US and Switzerland being increasing customers. Engineering exports are doing well at an increased 31 per cent for the first six months of the financial year, and the government's special programme is aimed at helping the industry to reach its overall growth target of Rs. 1,000 crores. Machine tools exports will be Rs. 10 crores this year, as its production base is being satisfactorily expanded to over Rs. 100 crores for the year. Other good export performance include leather, marine products and spices. To back up the export effort, the country's shipping is being increased from 4.2 million dwt at present to 6.5 million tonnes of GRT. During the first eight months of 1976, Indian exports to Canada increased from last year's $28.8 million to $47 million with increasing exports of woolen and textiles and ready-made garments as well as new items of engineering goods including electronic equipment. To further boost exports, the government is drawing up a new duty exemption list for the import of more raw materials and components against advanced licenses in addition to the existing 91 items. This will enable producers to plan their schedules in advance to meet the increase in export demand. Import of items not normally permissible under the existing import policy will be allowed under the new liberalised policy which will permit their exporting 20 per cent of their product and undertaking to continue this for five years to import machinery freely upto Rs. one crore in a year. The Fifth Plan export target is realisable and should be.

International :

World Monetary Reform : As noted in the last issue (Vol VI p 647), the fourth IMF gold auction was held on October 27 at which 7,79,000 ounces of gold sold at prices between $116.80 to $119.05 an ounce, yielding $60.2 million, bringing the total of the 4 auctions to $255 million. The average price of $117.71 per ounce was higher than that of third auction's $109.40. It is now proposed to hold the auctions at weekly intervals instead of at

intervals of six weeks in order to obviate the depressing effect on gold markets. For the developing countries this is a good move as it will speed the setting up of the proceeds of the fund to be used for their benefit. The other development in November was the small recovery of the British pound which gained 0.75 US cents in the foreign exchange market and stood at £ 1 = $ 1.6245. This was due to the negotiations of the UK government for a $ 3.9 million IMF loan and reports that the UK was negotiating a further multi-billion dollars loan (of a total of around $ 10 billion) in order to move sterling out of its reserve currency status. This involves transferring Britain's liabilities for same 6.3 billion sterling in the reserves of other governments and in private hands to other richer countries. The loan would be used to protect Britain reserves while all foreign depositors are paid off through a series of highly complex international negotiations. Also in mid November the UK government announced stringent measures to reduce sterling's role in international trade. British banks were prohibited from using sterling to finance commercial transactions except within the UK, so that the banks will no longer finance trading by the members of the overseas sterling area among themselves or with other nations outside the sterling area. The overseas sterling area formed in 1972, consisting of the Commonwealth countries, South Africa and some Arab (Gulf) countries was suspended. Further British banks are to deposit as interest free loans into the Bank of England any part of their liquid assets which exceed the Bank's guidelines. Despite these and other heavy restrictions on credit, money supply in the country continued to increase by 1½ per cent in October. As against its target of a 12 per cent increase in money supply for the year, within the first six months the increase recorded was 8¾ per cent. Efforts to contain inflation is one major condition of the IMF loan. A third development in November was the 17.5 per cent devaluation of the Australian dollar from $ 1.2329 to $ 1.0174 as a means of checking the 12 percent inflation rate. New Zealand followed with a devaluation of 7 per cent at 91 US cents to the New Zealand dollar and 89 Australian cents to its dollar.

OECD Countries Growth and Aid: OECD has revised downwards from 5 to 3.5 per cent the growth rate of its 24 member countries and for the first half of 1977 it forecasts a rate of 4.3 per cent instead of the earlier projection of 5.25 per cent. These lower forecasts are due to consumption goods not recovering as fast as was expected in these countries, stock building in the economies beginning to taper off, export led growth not being a possibility and the stronger economies, West Germany and Japan, drawing away from the weak ones, UK and Italy. On top of this is the uncertainty introduced by the coming OPEC decision on oil price increases. If the increase is more than 10 per cent, it will further slow down the recovery of these countries. OECD also reports that the total flow of resources from its 17 developed countries to the developing countries amounted in 1975 to $ 39.9 billion, which was 1.05 per cent of their combined GNP—in 1974 it was 0.82 per cent. But ODA is still well below the target of 0.70 per cent. Only Sweden (0.82 per cent) and Netherlands (0.74 per cent) have exceeded it. Six other countries, were at least on the way, Norway (0.66 per cent), France (0.62 per cent), Australia (0.61 per cent), Belgium (0.59 per cent), Canada and Denmark (0.58 per cent). USA with 0.26 per cent, Japan 0.24 per cent and

West Germany with 0.39 are the richest and the lowest in performance. The World Bank warned that the present low ODA percentage of 0.36 will on the basis of the current trend fall to 0.33 by 1980 when the second Development Decade ends. This could be reversed if the richest 3 countries increased their ODA by just 2 to 3 per cent of the increase in their per capita incomes.

International Fund for Agricultural Development : OPEC contribution to the one billion dollar Fund for Agricultural development was increased by $ 20 million as a result of Iran's decision to contribute that additional sum. The fund is still short of $ 30 million to reach its target of $ one billion, which it should before the next meeting of its preparatory committee in Rome on December 13. OPEC has decided to channel its share of IMF's gold sales profits amounting to $ 50 to 60 million to the IMF trust fund. Also OPEC has begun negotiating with 45 of poorest nations on lending them $ 200 million to help them meet their balance of payments deficits.

CIEC : The four commissions of the conference on International Economic Co-operation composed of representatives of 19 developing and 8 industrial countries (see Vol VI pp 209 and 451) met for 4 weeks in November and found themselves in serious disagreements on all basic issues concerning trade, debts, prices and development resources which are a part of the New International Economic Order debated at Nairobi (see Vol VI p 315) and Manila (see Vol VI p 582). This is serious because the decision of the OPEC meeting on oil prices, which has now been postponed to the end of December, will reflect the outcome of the CIEC decisions. The UNCTAD meeting in December in Geneva also will not be able to make progress unless CIEC arrives at agreements on the basis issues. EEC ministers are meeting towards the end of the month (November) to arrive at a common policy on the issues. The ministerial conference of CIEC scheduled to meet on December 15 is thus faced with a grave situation in view of the impasse at the commissions level. The suggestions to postpone the ministerial meeting made by the Industrial countries is being resisted by the developing countries. What is needed is a willingness on the part of the industrial countries to arrive at some agreement on at least finance and trade.

World Trade : GATT's report on world trade for January 1975-August 1976 states that world trade in 1976 would be smaller than the 1975 total of $ 37.5 billion. For the developing countries as a whole the 1975 recession caused a sharp decline of 8 per cent in their exports in quantum and 5 per cent in value terms. The combined current account payments deficit of developing countries without oil resources is likely to fall this year. After more than doubling in 1974 because of the price increase, the value of exports of primary products from the developing countries fell by 6 per cent in 1975, due to the £ 7.3 billion, 7 per cent, decline in fuel exports to industrial countries. The combined trade deficit of the oil importing developing countries which had almost trebled between 1973 and 1974, reaching $ 34 billion, rose further to $ 45 billion in 1975. This large deficit despite the decline in their imports, resulted from the stagnation of export earnings and the continued rise in their import prices. These developments in their trade balance resulted in the increase of their cumulative deficit from $ 29 billion in 1974 to $37.5 billion in 1975. For 1976 the deficit will decline

but be higher than in 1974. EEC is planning to set up a special agency to help developing countries to better utilise the opportunities open to them under GSP. The agency will have 2 departments, one for GSP and the other to deal with trade promotion. This will, for one, enable the developing countries to make fuller use of the GSP possibilities. For instance in 1974, GSP utilisation was 65 per cent, in 1975, 76 per cent, in 1976 an estimated 59-65 per cent and 1977 between 40 and 45 per cent. The agency could help fuller use of GSP by the developing countries incorporated in the Lome convention and others with whom EEC countries have trade and commercial co-operation agreements, through speedy non-bureaucratic business like decisions taken in close co-operation with firms and markets. The GSP department will also provide advice on the effects of the GSP on trade contracts to be awarded and market and product trading evaluations in the country. The Trade Promotion Department will prepare and execute trade fairs and fortnights in the Community and the developing countries, and organise trade missions, seminars and training courses to push trade. The agency could be a useful instrument for expanding trade between EEC and the developing world.

World Coal: World coal reserves are estimated at 53,30,000 million tonnes, with US having 43 per cent of the reserves followed by USSR 23 per cent and China 21 per cent. India with 69,000 million tonnes has 1.3 per cent of the world coal reserves. The US reserves of 4,00,000 million tonnes will last for 300 years at the present rate of consumption. Future scenarios allow for increased coal consumption to meet increased growth, involving an increase in output from the current 550 million tonnes to 700 million tonnes in 1980 and a further 25 per cent increase to 1,000 million tonnes in 1985. There is no question of the rapid exhaustion of this resource. One of the problems faced by Australia and Canada is insufficiently available of every category of trained personnel so that only capital intensive mining methods are involved. Canada which has the same reserves as India is in the unique position of importing coal from the US and exporting its coal to Japan. West Europe which has 10 per cent of the reserves is using less and less of coal, with the switchover to liquid fuel, dispite the rise in the price of oil. There is however a real possibility of substitution here.

World Population: The World Watch Research Institute reports a decline in population growth in rich and poor countries alike—due to falling birth rate in the former and unforeseen deaths from hunger in the latter. It also reflects the greater availability of family planning services in all countries and the growing desire to use them, including the contraception, sterilisation and abortion facilities. This means that the forecast that world population will double by 2000 AD will have to be reviewed in light of these declining trends.

ADB: The quarterly report of the Asian Development Bank states that Bank loans of $ 3,009 million have been given to 247 projects in 21 countries, including $ 742.32 million in 105 loans from its Special Funds to its poorest member countries. The other 165 loans for $ 2,266.78 million have been made from its ordinary resources. In agricultural and agro industries, $ 720.94 million has been granted (23.96 per cent), industry

$ 559.56 million (18.60 per cent), and education $ 27.60 million (0.92 per cent). $ 25.55 million was approved for 168 technical assistance projects in 12 member countries and $ 6 52 million for 36 regional technical assistance projects. Because of the improved borrowing conditions in the world's capital market, the Bank announced in November a reduction in its interest rate on ordinary loans from 9.1 to 8.9 per cent and for those countries whose per capita income exceeded $ 850 million from 9.7 per cent to 9.5 per cent. Loans from the special funds will continue to be interest free, with a one per cent service charge, repayment over 40 years including a 10 year grace period.

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II Agricultural Development

Paddy and Foodcrops :

It is difficult at this stage in November end to evaluate the prospects of paddy production for this year. The month started poorly in rain, the low storage in Mettur led to closing down of the reservoir and the advice to the farmers in Thanjavur district not to go in for Thaladi paddy cultivation this year, so that out of a total of 2.77 lakh acres of kuruvai paddy area, the early planted kuruvai crop covering 77,000 acres only would be followed up with thaladi paddy which should normally cover 3 lakh acres. 5 lakh acres have been planted with samba paddy as against 6.59 acres last year. Later in the month, when it rained heavily, which was of benefit to the samba crop in the Thanjavur district the kuruvai harvest underway was affected. Alternate crops to thaladi paddy are being grown in the district covering 2 lakh acres of kuruvai land and 4 lakh acres of uncultivated samba fields with pulses, gingely, maize, ragi, cotton and groundnut which require little water. In fact there is a case for ensuring that all paddy cultivation is under HYV strains and that dry farming cultivation of pulses, maize, ragi, groundnut becomes a normal second or third crop for the farmer in this district. The government states though there is a shortfall in the area under paddy cultivation, the per acre yield of kuruvai paddy has registered a 10 per cent increase, so that there will not be a serious decline in the State's overall food grain production. There is also need to study the effect of the copious North East monsoon on foodgrain production. Even chronically drought prone areas like Ramanathapuram and Tiruchirapalli districts have had very good rains from the North East monsoon. Using this resource, an additional 2 lakh acres in addition to the usual 4.5 lakh acres is being brought under groundnut 40,000 additional acres under gingelly in addition to the normal one lakh acres, and pulses in rice fallow is being extended

beyond the 5 lakh acres by 1.5 lakh acres. The government reports that in some 10.5 lakh acres are under samba and kuruvai in Thanjavur district against the normal 11.4 lakh acres, in Tiruchirapally instead of the usual 3.6 lakh acres 2 lakh acres are under paddy due to the lack of water in the Pullambadi and other canals, in Pudukottai district out of the usual 2.6 lakh acres 1.7 lakh acres are under paddy cultivation and in Salem instead of 1.5 lakh acres 80,000 acres have been brought under paddy. Co-operative credit of Rs. 110 crores as short term credit and Rs. 5 crores as medium term loans are being made available to farmers. In Kanyakumari water was released from the Papanasam reservoir, eighty four thousand acres in Tambarapani were provided with water for raising the main Pishanam paddy crop. There will be a net decline of 3 lakh acres in Thanjavur district and one lakh acres in the other districts in paddy cultivation. Cholam (Jawar) cultivation is rapidly increasing in the State due to its higher yields, good drought resistance and lower susceptibility to pests and diseases. 40,000 acres are under hybrid jawar at present in Chingleput, North Arcot and Coimbatore districts, where CSH-5 is grown and Ramanathapuram, Madurai, Pudukottai and Tirunelvali districts where CSH-1 and Koilpatti Tell is grown. In many of these areas jawar has replaced ragi, cumbu and dry paddy because of its particular suitability to dry and meagre rainfall areas.

Fruit :

Banana production in the State has become a major horticultural product—particularly the 2 varieties of Dway Cavendish and Robusta. The Banana Package Scheme is in operation in the banana growing areas of Vellore, Tiruchi, Erode, Dindigul and Tuticorin where the fruit is being grown over 35,000 acres. In addition using the techniques involved in proper planting, manuring and plant protection, the farmers are experimenting with double planting. This year's crop is estimated at 3.5 lakh tonnes compared to last year's 2.7 lakh tonnes. The move to reduce the number of varieties of bananas exceeding 1,000 is a right one and the Package Scheme enables the farmer to choose one variety and stock to it, applying to it all the modern practices, including proper spacing, identification of disease free pedigree suckers and inter-cropping, harvesting and marketing. For the first time this year, the State will be exporting 747.5 tonnes of bananas to the Gulf Countries and earning foreign exchange.

Research Results :

The rice pest, brown hopper, which started in Kuttanad in Kerala and is spreading in this State and others, calls for intensified research to contain and counter it. One way is for varieties that are resistant to the brown hopper, of which there are as of now twelve once to be cultivated. The pest can also be countered at the paddy seedling stage which requires close watching of the plants for this menace. AICRIP, Hyderabad, is in charge of the programme. A continuous and related research programme relates to the appropriate doses of the costly chemical fertilisers, despite the increased production at 2 lakh tonnes of nitrogen reported by FCI during the first six months of the current financial year. In addition to the proper dosages of nitrogen in particular soils, the use of rock phosphates in acidic soils is now gaining ground as a result of successful research efforts. In the growing of groundnut, a new variety Jawahar Moonsphali-2 which performs well under rainfed farming is now available for the dry farming areas in the State.

It is high yielding and early maturing and has an oil content of 52.5 per cent. Another variety released is for cotton, Jawahar Kapas-1, yielding 40 quintals per hectare which can be grown in our black soil irrigated lands. Similarly a wheat variety adapted conditions in this State and other Southern States, Narmada 112, has been released and assures large yields and pest resistance. Another new area of research is the use of radio isotopes and radiation to identify deficiences in live stock nutrition, such as tracing the calcium deficiency in some of pastures which produce cattle fodder, its use in enzyme analysis, in radiation attenuated vaccines and in hormone analysis. New varieties of sugarcane are being evolved in the National Hybrydisation Garden at the Sugarcane Breeding Institute in Coimbatore, enabling quicker replacement of existing varieties by the better ones and a concerted attack against the scale pest which afflicts cane farms.

Animal Husbandry:

Sheep breeding centres are being set up in Tirunelveli district for small and marginal farmers affected by the drought. Some 3,000 farmers and labourers are participating in the scheme, comprising centres with 20 ewes each costing Rs. 3,000. The government subsidy is 25 per cent for small farmers and 33 per cent for marginal farmers in each centre, the balance being provided by the banks. In other drought prone areas like Srivillipu-thur and Virudhunagar in Ramanathapuram district, dairying as a subsidiary occupation is being developed. 205 members in 15 milk co-operatives in Srivilliputhur and Virudhunagar received medium term loans of Rs. 2.05 lakhs, as well as 30 members of the Chitrapatti Co-operative Milk Society in Rajapalayam taluk who were given a credit of Rs. 1,500 each and the Tirunelveli milk co-operatives who were given Rs. 3.30 lakhs for purchase of cattle fodder. These areas are now developing into good and sound milk pockets. The Tamil Nadu Dairy Development Corporation is increasing milk supply in Madras city from 2 lakh litres to 3 lakh litres which will enable it to distribute milk freely without any family ceiling. Within 4 years, the Corporation has increased its turnover from Rs. 2 crores in 1972 to Rs. 22 crores in 1975. The Corporation has a net work of 1,288 milk producers co-operative societies which collect milk from the co-operatives and despatch it to the chilling station to Madras. The dairy colonies throughout the State are being rapidly expanded each with its own cattle, fodder and medical facilities, with the Corporation providing an assured market and stable prices.

Tea :

Tea output for the current year is estimated at 511.4 million kgs. of which 224 million kgs. would be exported at a value of Rs. 262 crores. For the first six months of the current financial year 94.61 million kgs. were exported and earned Rs. 116.02 crores, compared to the first six months of last year when 97.14 million kgs. were exported, earning Rs. 112.26 crores. The higher unit price of tea of 70 paise per kg. is not only due to the market forces, but an increase in the export of 3 value added non-traditional items, pocket tea, tea bag and instant tea, which registered a 45 per cent increase, from Rs. 5.76 crores in April to Rs. 8.34 crores in August. Instant tea has become popular, increasing to 19,000 kg. in April-August (from 15,000 kg. last year), Indian packet tea going from 3.12 million kg. during last year's April to August to 4.5 million kg. this year, and tea bags earning Rs. 45.5 lakhs compared to last year's Rs. 22.7

lakhs. The country's perspective plan for tea envisages a production of 1,000 million kg. by 2000 AD, requiring an investment of Rs. 45 crores a year. This means that in 1980 production must be 610 million kgs. and in 1985, 750 million kgs. In the Fifth Plan Rs. 10 crores have been allocated for the development of the tea industry.

Coffee:

The need for increase in the land under coffee production is once more emphasised. It is estimated that some 51,644 hectares of land are available for further expansion of coffee. But there is also the need for replanting in 11,500 hectares where the coffee bushes are overaged. Due to frost in Brazil, floods in Colombia, earthquake in Guatemala and unsetted conditions in Angola, coffee prices have shot up steeply and the Rs. 75 crores export target for this year will be surpassed. The government has increased the export duty from Rs. 300 per quintal to Rs. 1,300 per quintal to mop up a part of increase export earnings. A greater part of this increased tax revenue should be invested in the replanting and expansion of coffee producing lands programmes as one means of ensuring that the coffee industry rests on a sound and growing production and internal conumption base.

Rubber:

Rubber production for the year is estimated at 1.5 lakh tonnes and synthetic rubber at 25,000 tonnes. At the same time 6,000 tonnes of quality rubber is being imported. The estimated consumption of rubber based industries in the country will be between 1.6 and 1.7 lakh tonnes. With the inventory from last year, the government is exporting 15,000 tonnes of which 5,000 tonnes have been exported and another 4,000 on the way, by STC.

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III Industrial Development

BHEL:

BHEL reports a large re-organisation of its programme and structure to consolidate its engineering expertise and improve its planning process. Its Power Planning Division will ensure speedy execution of power projects, safeguarding quality and its Engineering Development division will aim at creating new technologies and developing new product lines. It has produced 3,500 MW equipment and is geared to move on to 5,000 MW. In output which was Rs. 100 crores in 1971-72 was Rs. 41 crores in 1975-76. Its export programme is expanding. Following its fabrication for Kalpakkam of the nuclear steam generator (see Vol

VI p 656), it has manufactured the country's largest 400 KV class power transformer for the oira thermal power station in UP. It has secured orders for 22 power transformers and reactors and 200 instrument trransformers of 400 KV class. 1,000 of its engineers are working on various power projects for which BHEL had supplied the equipment. Thus when Ennore's fifth unit broke down, BHEL engineers walked in and put it back for generation within seven weeks. It has finalised the diversification of REMCO, Bangalore and Mysore Porcelain which it has taken over (see Vol VI p 386) to produce industrial electronics in the former case and power equipment insulators in the case of the Mysore unit.

TIIC:

TIIC announced at the end of October the creation of a Rs. 50 lakhs special capital fund to help entrepreneurs invest in backward areas of the State, with the help of a special call. The fund is being used to create small scale units with a ceiling of Rs. 7 lakhs. Having used up the World Bank's first line of credit of $ 25 millions, it has now received from the World Bank a second line of $ 40 millions credit to be used by December 1978. Under this credit, entrepreneurs would get import licenses automatically. Small units will pay an interest of 11.5 per cent and medium ones 12 per cent. Also TIIC and SIPCOT have worked out common arrangements for appraisals for financing medium projects and planning promotion of small projects.

Small Industry:

Between August 10 and November as planned (see Vol VI p 657) 5,900 small scale units were registered in the State, a third of them registered in the 8 industrially backward districts. In this special drive, the State Bank of India from September 1 to November 19 made advances of Rs. 1.30 crores to 2,400 small units, providing employment to 10,000 persons covering engineering, textiles, food, leather, electronics and electricals, paper, chemicals and plastics sectors. In the same period it financed 8,000 weavers to the extent of Rs. 1.20 crores. This is in addition to the Rs. 55.04 crores provided to 15,764 small units in the State. The government is at work on an Industrial Escort Service providing the infrastructure for the small units, land, water, power etc. and it is in this context that the relaxation of the power cut for small units by the government should be seen. The government has set up a new target to create within the next 12 months a further 10,000 small units to provide employment for 60,000 persons.

Minerals:

GSI reports that the bauxite resource survey of the East Coast indicates a reserve of 500 million tonnes. The bauxite deposits on the coast are continuous and not in isolated pockets as in other places. Also the Pallavaram quarry which produces blue granite metal reports that as a result of improved management-labour relations, it has been able to increase production and end 1975-76 without loss. It has mechanised its operations as a result of which it has doubled its daily production from 12 lorry loads to 20-25 lorry loads. In the development of Karnatak's Kudrumukh iron-ore project, the Earth Equipment Division at Trivellore factory is producing 500 machines now per annum, compared to the 65 machines produced 3 years ago,

with an indigenous content of 65 to 86 per cent. The Trivellore factory is also purchasing from Hindustan Motors 3,400 sub-assemblies and parts, which is a threefold increase in orders placed with this ancillary.

Hindustan Photo and SIPCOT:

HPF reports a doubling of its production in the current half year from 1.37 million rolls last year to 2.7 million rolls. For the year as a whole it will produce 8 million spools compared to last year's 3.7 million. With imports, there will be 14 million spools, so that there is now no shortage of raw film or photograph films in the country. In addition to complexes at Ranipet (North Arcot), Hosur (Dharmapuri) and Maraimalai Nagar (MMDA), SIPCOT is developing two more complexes at Ramanathapuram and Pudukottai. In the complexes, housing for managerial and other personnel is being constructed by the Housing Board for SIPCOT, similar to the housing facilities being constructed by the Housing Board for SIDCO at Arambakkam, Villivakkam and Kodingiyur with World Bank help for small units industrial sheds. The government is also considering treating as subsidy part of the advance paid by SIPCOT to consultants for the feasibility study of a project in the complex. SIPCOT and TIIC with nationalised banks are in a position to meet the loan requirements for a project for upto Rs. 90 lakhs. Under the 15 per cent central subsidy scheme for backward areas, the 26 taluks in North Arcot, Pudukottai, Madurai, Ramanathapuram and Dharmapuri districts, SIPCOT has to date sanctioned Rs. 4.5 crores to 184 units. Under the State sales tax relief scheme, SIPCOT has sanctioned Rs. 2.25 crores for 18 new medium industries and Rs. 95.3 lakhs for four expansions of large units—located in the backward districts of South Arcot, Tiruchirapalli, Madurai, Ramanathapuram, Kanyakumari, North Arcot, Thanjavur, Pudukottai and Dharmapuri.

Test House:

The foundation stone for a Regional Test House was laid on November 1 in the Adyar complex to provide consultancy services to small scale industries and train scientists and technicians in testing, evaluation and systematic research. This is the regional branch of the National Test House which provides for the country testing and evaluation services for materials and products. The Regional Test House for which a provision of Rs. 44 lakhs has been made for the balance of the V Plan has been functioning in temporary accommodation in the Guindy Engineering College campus and has already received 400 samples for testing. The Test House will (a) provide testing and evaluation facilities for materials and products manufactured to ISI standards, (b) offer technical services to industry in selecting material processes and machines, (c) undertake applied research in science and technology of materials and provide R and D support and (d) train in evaluation technology personnel in industry and science and technology students.

TIDCO and Electronics:

TIDCO is planning to set up a joint sector project on export oriented finished leather, particularly foot-wear, another joint sector project for producing instant coffee, and a third project in the joint sector for Rs. 3 crores magnesium plant. It is also setting up a second cement factory and an asbestos unit. The

government also is planning to set up a Tamil Nadu Electronics Corporation to promote through private entrepreneurs the setting up of electronic units. The State is currently producing Rs. 3 crores of electronic items out of the Rs. 300 crores produced in the country and a study is being completed as to the State's industrial capability in electronics, the broad areas for new production, the location of growth centres and the total export prospects on the basis or which the Corporation will function.

Sugar and Seri-culture:

Sugar production in the State which declined to 20 lakh tonnes in 1975-76 from 53 lakh tonnes in 1973-74 and 45 lakh tonnes in 1974-75, is estimated at 35 lakh tonnes for the current year. To further increase sugar production in the State, two public sector sugar factories at Thanjavur and Perumbalur are coming up and licenses for four units at Sankarankoil, Thirukoilur, Sivaganga and Coimbatore have been obtained and two more requested for factories at Mayuram and Tiruttani. Each of those will cost Rs. 6.5 crores and will crush 1,250 tonnes of cane a day. The government also announced in November the setting up of an institute of Sugar Technology to help in growing disease free cane, use biological control of pests, adopt extensively the practice of ratooning and evolve new processes for improving extraction of sugar from available cane. Another area to be expanded is seri-culture now spread over 10,000 acres (compared to 1.5 lakh acres in neighbouring Karnataka). With the development of cacoons which can thrive in the plains, it is proposed to use these varieties to add 20,000 acres to the mulberry industry in Dharmapuri, North Arcot and Tiruchirapalli districts.

Textiles:

The textile mills in the State and in the South are facing a serious situation. Their arrears to the State Electricity Board amount to Rs. 3 crores, and the sales tax and other statutory liabilities of the weak mills are unpaid. 6 mills have been closed for over 6 months and 20 others are working partially. Another problem facing them is the high price of cotton. The mills have requested the Union and State governments to grant them a moratorium of the electricity and sales tax dues and to regulate the price of cotton to what they call the break even point. Meanwhile the Union government committee set up to study the problems of the Southern Mills (see Vol VI p 513) has submitted its report and it is under study by the Government.

Handlooms:

The State's 5.5 lakh handlooms, about a quarter of them (1.59 lakhs) covered by 700 primary production and sales societies with above 20 lakh people dependent on them, faces a good internal demand but something of a slump in its exports amounting to Rs. 185 crores last year for the country as a whole. Co-optex with its 323 retail selling units has increased its turnover from Rs. 4 crores in 1970-71 to Rs. 17.5 crores in 1975-76 and reports a target of Rs. 25 crores for the current year. It has disposed of its accumulated stocks of Rs. 5 crores and has wiped out its accumulated losses of Rs. 32 lakhs and made a profit last year of Rs. 50 lakhs which is to be passed on to the weavers. To compete on equal terms with mills, it is modernising its 85 show rooms at a cost of Rs. 1.3 crores. production in the co-operative sector is expected to rise from Rs. 35 crores in 1975-76 to

Rs. 40 crores this year, and on to Rs. 85 crores a year in the next 5 years. It has also decentralised its management in 12 Regional Offices which together with latest expertise in operation will attain higher levels profitability and viability. On the export side, large quantities of handloom garments exported to the US are lying uncleared because of a slump in demand for garments. There is a danger of the Rs. 5 crores stock being sold in auction and depressing the already depressed garment market further. The alternative is for the Union government to hold these stocks till the market conditions improve.

Leather:

The export of finished leather for the first six months of the current financial year was Rs. 175.41 crores compared to Rs. 105.59 crores last year. The target of Rs. 300 crores for next year is thus attainable, involving the export of 60 million pieces of finished leather annually. To promote the production and export of leather of uppers and foot-wear STC has sanctioned Rs. 1.05 crores to 19 units, of which 15 are small units receiving Rs. 25 lakhs. Of the other 4 large units which will receive Rs. 85 lakhs, two will be in Ranipet (one of which under TIDCO as noted earlier). An RBI study techno-economic study of the leather industry emphasises the need for the producing units to change from proprietary/partnership concerns (which is the major organisation of the industry in this State) to corporate entities in view of the large outlays they need and their high debt equity ratio. It suggests that a start can be made in this direction by registering the finishing sections of the leather units as limited companies as the large investments needed concerned these sections, The Chairman of the Leather promotion Council in the State has appealed for government assistance to small tanneries for tackling the problem of tannery wastes, which is beyond their means (see Vol VI p 280).

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IV Education, Science and Health

Educational Reforms:

On November 5, the State government issued the official order stating that the 10+2+3 system will start from 1978-79, which means that the last 11 year S.S.L.C. examination will be written in March/April 1978 and the last P.U.C, examination will be in March/April 1979. The government has set up a special staff to study and prepare for the smooth changeover to the 10 plus 2 system under the aegis of a steering committee headed by the Education Secretary, with the Finance Secretary and the Director of School, Collegiate, Technical Education

and Government Examinations as members. The 11 year school syllabus has been compressed into 10 years and introduced from 1972-73, so that all the standards 1-10 will be covered by the new syllabus this year, 1976-77. Since the students in standard 10 have been using the revised syllabus only from last year, they have been allowed to take the S.S.L.C. examination in March 1978, covering in 3 years the revised syllabus for standards 9 and 10. The University Syndicate on its side has asked all colleges to report by February 28 their plans for dropping P.U.C. after 1978-79, or run the higher secondary under the Board of Higher Secondary Education for a transitional period of 5 years or become themselves Higher Secondary Institutions, the deployment of the P.U.C. staff when the P.U.C. is no longer a university course and the financial situation they will face. These reports will be examined by a joint government university committee in March and decisions made on all 3 subjects, the transitional higher secondary plans of the colleges, the deployment of P.U.C staff who will be needed for the semester courses, and the financial needs of the colleges. The most important decision made by the University was to set up an Undergraduate Review Committee consisting of 32 members who will review and restructure the first degree course to make it a sound broad general formation course, with foundation courses, core courses, specialised disciplines and community and social service. In the new 10 year school, the stages will be 5+3+2. The Director of School Education has been asked to send proposals for ensuring that standard 8 is handled by teachers better qualified than now. The new pattern, particularly the+2 stage, will cost the government Rs. 22 crores over the next 5 years, mostly for the vocational streams. The State Government is setting up a committee to scrutinise text-books contents to introduce chapters on the freedom movement, cultural heritage and the achievements of the country. A workshop in Madras University organised by the UGC task force on teacher education emphasised the need to relate teacher education with the socio-economic environment of the schools and national goals, and suggested new programmes of B.A. and M.A. in education, a five year integrated teacher education programme after the Higher Secondary leading to M.A. in education, a one year B.Ed. for students who are B.As. in education, and an enriched B.Ed. programme for degree holders. Also a special training programme for teachers of the plus 2 stage and in all courses minimal use of lectures and increased use of seminars, symposia etc. are recommended. The Maharashtra government has introduced the English medium for science and mathematics from standard VII in the State's schools. This reform will be watched with interest by all States and its impact on the development of the regional language will be particularly noted. A study by a Tiruchirapalli college student of the Narikoravas shows that their education is neglected, for a 112 student elementary school there is only one teacher, and only 40 per cent of students get a mid-day meal. Attempts to settle them by building houses for them and giving them land for cultivation has not succeeded as they prefer to continue their traditional avocation of making bead necklaces and go around from place to place and between States selling them. The annual conference of Public Service Commissions has decided that their recruitment examinations should be given a rural bias, with no bias against rural candidates and those from scheduled castes and tribes. The State government has granted the

Saraswathi Mahal Library a sum of Rs. 2.48 lakhs to purchase a micro-film unit and an air-conditioned room for housing it. In this manner, the thousands of precious manuscripts will be filmed and preserved.

Technical Education

The Southern Regional Committee of the All India Council for Technical Education has recommended the strengthening of the Directorate of Technical Education to improve the management of technical education institutions. It also re-emphasised its earlier recommendation for grant of autonomy to some Polytechnics and to give training to all polytechnic teachers through the Madras TTTI and providing industrial experience to all polytechnic teachers under the Union government's quality improvement programme. It recommended promoting R and D and consultancy services at the different engineering colleges and polytechnics. It also decided that the intake to polytechnics and engineering colleges should be strictly related to the available facilities of the institution in order to avoid lowering of standards. The report on the first graduates of the State Institute of Co-operative Vocational Education, Tiruchirapalli shows that the 7 semesters 3½ years course is so organised that half of the students are studying in the college and the other half working with an employing agency, specialising in architecture and interior design, electrical appliances and systems and textile and fashion design. There is real work experience built in the course and the students impress employers by "their aptitude, intiative enterprise and hard work." Medical colleges in the State are being linked with 3 or 4 primary health centres in order to train medical students to deal with rural health problems, and provide total health care for rural areas. The University and government have under consideration a plan to raise the Medical colleges in Madras to the status of a post-Graduate Institute of Medical Education and Research, under which the five medical colleges in the city will be upgraded to post-graduate status, some 5 university chairs established in the colleges and an overall council established to bring together this upgraded institute and the university Post-Graduate Institute of Basic Medical Sciences. From December 1, the Madras Veterinary College and its research stations cease to be an affiliated college and becomes a constituent unit of the Tamil Nadu Agricultural University. This decision will enable the University to draw the full grant to which it is entitled from the ICAR, and will back up the college with the expertise of the Agricultural scientists. The college will continue to function at Madras in its large and good campus. This is in line with the recommendation of the State Planning Commission for the Veterinary, Home Science and forestry and fishery sciences being a part of the Tamil Nadu Agricultural University (see Vol. II No. 12 pp 1-3).

Science :

CSIR announced in November the setting up of a multi-disciplinary team of scientists to improve the bullock cart, carrying forward the work done by CRRI to reduce the stress on the bullocks and improve its design and material. Also a new floating wheel with floating ball bearing reduces the strain on the road. In order to prove that the technology developed by its laboratories is good for industrial applications, CSIR is planning to start some industries of its own to apply its technologies. It also inaugurated

in November a CSIR poly-technology clinic which would offer the services of any of the 47 national laboratories to any industrialist requiring it, on payment of a fee for its services. Bangalore has been chosen as the site for the regional centre for transfer of technology to be set up by ESCAP. It will promote national centres and strengthen existing centres providing technical consultancy and clearing house service. India will provide Rs. one crore worth of land, buildings and other facilities. The Regional Research Laboratory, Hyderabad has produced various kinds of industrial rubber and plastics at a high level of excellence. The National Aeronautical Laboratory has developed a technology for fibre glass reinforced plastics, NCC has *developed a process for the manufactured* polyethene printing rollers and polysulphide rubbers and the CFRI has developed processes for producing resin from coal tar oil. NML has developed the technology of making manganese from electrolythic process and pure calcium from limestone and CECRI the technology to produce sodium metal from sodium chloride and tin from tin scraps, CSIR also announced that from researchers in medical and aromatic plants will get a regular flow of computerised information to meet their individual specific needs through the work of its publication and information directorates. CWPRS after surveying the research needs of the country in hydraulic and allied engineering is now developing research on pollution prevention and development of tidal energy from the country's coast. The Atomic Energy Commission has set up an inter-disciplinary research team on power reactor water chemistry which is needed not only by nuclear power stations for ensuring and enforcing proper water chemistry conditions but also by the Fertiliser Corporation and State Electricity Board.

Health :

On the health front, the State Government reports that by end October 3 lakh sterilisation operations have been performed out of the 5 lakh target for 1976-77. Last year the target was 2,11,000 and the achievement was 80,000 more. This year the more than doubled target will be achieved without any additional inputs as there is growing acceptance of the Family Planning programme by all communities. Against the present birth rate of 29 per thousand, the State will achieve its target of 25 per thousand by the end of the Fifth Plan (the all India rates are 37 and 35 per thousand) and the government is planning to fix the *sixth plan target at 20* per thousand. In mid November the government announced one advance increment to all non-gazetted officers, employees of all bodies and co-operatives for those who have undergone the sterilisation operation after 3 children and less. This incentive is offered from April 1976. Also each panchayat Union which achieved its family planning target would receive a cash award of Rs. 1,500 for Madras Corporation Rs. 20,000, Madurai and special grade municipalities Rs. 10,000 and other municipalities Rs. 1,500-2,000, as from April of this year. The local body performing the maximum number of sterilisations would be awarded Rs. 6,000 as first prize plus a State prize of Rs. 30,000 and second prize of Rs. 4,000 plus a State prize of Rs. 20,000. The government reports that of the 76 eligible couples in the State, 92.4 per cent are Hindus among them the acceptors are 92.94 per cent, 4 per cent eligible couples among Christians and 3.4 per cent among Muslims. The Union government has in November published its service rules on Family Planning under which any Union government servant who has more than 3 children after September

1977 will not be entitled to maternity leave, children's education allowance, leave travel concession, government accommodation and house building advance and conveyance allowance. These disincentives are aimed at getting Union government employees to conform to the small family norm. But this is part of the integrated health scheme under which family planning, nutrition, child health and basic health, services are formed into a package both to reduce population growth and to solve the problem of malnutrition of children and lactating mothers and rural ill health generally.

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V Employment

In November the State and Union governments announced revised minimum wages for construction workers to be effective from 1 December 1976 under which hill stations (Zone A) will pay Rs. 7.20-Rs. 15 for adult workers, Corporations (Zone B) Rs. 6.60-Rs. 13.75 and other areas (Zone C) Rs. 6-Rs. 12.50 —depending on the category of workers. DA is also payable accordingly at the rate of 2 paise per every 5 points rise in the Madras consumer index above 1,500 points adjusted from January 1 every year. The State is also undertaking a survey of workers in 27 unorganised industries such as tanneries, handlooms and beedi units with a view to ameliorating the workers, conditions. The Central Apprenticeship Council announced in November that the number of located apprenticeship seats has increased form 1,10,087 to 1,52,496 and those for trade apprentices from 69,236 to 1,50,197. The Council also brought 33 more trades and their syllabi, list of tools, and equipment under the scheme, making the total trades 136, 45,000 of trade apprentices belonged to the scheduled castes and backward communities, it reports. As noted earlier, the government has a chance of creating employment and reducing our growing unemployment and saving on the 20 per cent deterioration of our 17 million tonnes foodgrains reserve and relieving the inflationary pressure of the ever growing foreign exchange resources on the economy by using both the foodgrain and foreign exchange resources to generate employment. A massive public works programme in minor irrigation, road constructon, and other projects in backward areas can be launched to create employment and the workers can be paid wages in foodgrains from the reserves and other wage goods such as imported raw cotton and edible oils which the receiving worker and his family can turn into finished goods. The other wage goods can be imported with our foreign exchange resources. This programme will not only be non-inflationary but will also provide the infrastructure for increasing foodgrains production in future years.

VI Other Items

NCERT:

NCERT convened in early November a 2 day seminar on Educational Research priorities. There was general agreement that educational research is still in its infancy in India and that the priorities are for research on education as a force for national development, as a means of promoting equality and the development of the weaker sections in society and the psycho social elements involved in education of children and adults. On each of these themes there was a report of a task force which was debated and reviewed. Out of the conference arose *an inventory* of educational research themes which NCERT was requested to arrange as a phased programme over a period of 5 years. The conference was followed by a meeting of the Educational Research and Innovations Committee of NCERT which reviewed the research projects completed and those under way and made suggestions for their follow up in appropriate terms. Also the committee examined the requests for new projects and suggested deferring those which required more information or which were not a priority.

IUACE:

A meeting of the executive committee of Indian University Association for Continuing Education was held in early November. It reviewed the recommendations workshop on correspondence education held at Chandigarh and decided to request the director of the workshop to circulate them to the directors of the correspondence education programmes of the Universities and to examine them at a meeting in December in order to decide on the resulting programme that it will place before the Association of Indian Universities. It also decided to postpone to March the seminar on training courses organised by University Departments of Adult and Continuing Education at the North East Hill University, Shillong in view of the need for more time for preparing it. The committee established the details of the one day seminar programme to be held at *Coimbatore the day* before the meeting of the Association of Indian Universities.

30th Anniversary of UNESCO :

The 30th Anniversary of UNESCO was celebrated all over the Country on November 4 and *during the week in* colleges, universities, schools and by voluntary organisations. The President of the Republic presided over the celebration in New Delhi organised by the Federation of UNESCO clubs in India. The services of UNESCO for peace, international understanding and development of education, science and culture were recalled as well as the problems it was facing as a result of its involvement in the problems of war, tension and racialism that still characterise the world. The President presented awards to Mr. Kirpal and the Director of MIDS in commemoration of their services to UNESCO.

NCAER :

The National Council of Applied Economic Research in co-operation with the UN

Institute for Development in Asia called a meeting of the Research Institutes in the country. Dr. Madan in his Presidential address chalked out an inventory of economic research priorities for the country, with which there was general agreement. All the institutes represented at the meeting had one factor in common. Unlike the research conducted by the Universities, the research conducted by the institutes is the result of specific requests by the government or public or private sector business units. It was decided to form an association of the research institute for the purposes of exchanging Information on the work under way and help each other with data and methodologies.

Indian Geographical Society and Geological Survey of India :

The Indian Geographical Society celebrated its Golden Jubilee in the Madras University in November. The Conference concentrated on the development of resourses, particularly in the backward regions of the country. It agreed on a programme of inter-disciplinary research for the coming years and suggested that the teaching cf geography should be updated in the schools and universities. The Geological Survey of India also celebrated its 125th anniversary in November and the occasion was a proud one recalling the excellent work accomplished by it in surveying the mineral and water resources of the country. There was a a call for closer co-operation between the Universities and GSI in order that the areas still to be surveyed may be done with the help of Universitiy geologists and that a science museum should be established in Madras with its help. There was also emphasis on the need for planners, economists and engineers to work together to convert the mineral wealth of the country into a force to raise the levels of living of the poor majority.

Racing Committee and Tamil Nadu Council of Historical Research :

The Third meeting of the Committee on Racing was held in Madras University at which the evidence given by a number of members of the public was examined. It was noted that the various forms of betting and the prizes associated with it such as the Jackpot need closer examination at future meetings, when the results of the field study on racing by the Institute for Techno-Economic studies becomes available. Also in November a meeting of the Tamil Nadu Council of Historical Research was held at which the applications of some 20 selected candidates for the Council's Fellowship for 1976-77 were reviewed. The Council selected 4 fellows for the year and authorised the Chairman to finalise the nominations in light of the views of the referees.

WUS :

There were 2 meetings of the World University Service during November. On third November the 6th anniversary of the WUS centre was celebrated with the Governor as President and Adviser R. V. Subramaniam as the speaker. The Governor took the occasion to congratulate the Centre and its members for their good intellectual and community service programme and in response to the financial difficulties faced by WUS, converted the 1972 State government loan of Rs. 1.5 lakhs to the WUS Centre into a grant. The President of WUS thanked the Governor for this generous gesture. The other

WUS event was a meeting to congratulate and award prizes in the form of cycles—some of them of the export variety—generously donated by TI cycles to the winners of the Madras-Bangalore cycle Rally. It was agreed that this was a good inter-collegiate event and should be further expanded in future years.

Colleges visited and Post-Gradute Centre-Tiruchi Inaugurated :

During November, the Vice-Chancellor of Madras University visited 3 colleges in North Arcot and Dharmapuri districts. During the visit to the Sacred Heart College, Tirupathi, the village adoption programme of the college was inaugurated and the NSS volunteers congratulated and advised as to the contents of the programme. The Government Arts College, Krishnagiri was next visited. The college is the focal point for the University's participation in the Union government's programme to integrated Rural Development which is to be centred in the Dharmapuri district. The organisation of the college participation was discussed with principal, staff, students and later with the District Collector. Also the foundation stone for the village school was laid during the visit. The third college visited was the Government Arts College, Dharmapuri during which the University's semester system and reformed examination system were explained to the staff and students. Following these visits, on November 12 the Chancellor of the University inaugurated the new campus of the Post Graduate Extension Centre, Thiruchirapalli. The Centre is under the guidance of Prof. Mani Sundaram, Principal, Regional Engineering College, Tiruchirapalli. The Governor as Chancellor congratulated the University for setting up the centre and wished that the centre and the colleges in the city will develop soon into the University of Tiruchirapalli.

Adam Smith Seminar and Lectures:

In commemoration of the 200th year of the publication of Adam Smith's Wealth of Nations, Madras University and Kerala University joined together and organised a seminar in Madras from 15-16 November and in Trivandrum 18 and 19 November. The Madras seminar was attended by 100 economists from the two Universities and JNU at which 17 papers on Adam Smith as the founder, and on his theory of value, capital, wages etc. were presented and discussed. The Trivandrum seminar was attended by 50 economists including those at the Centre of Development Studies and 6 papers on Adam Smith's innovations, his theory of development, prices, labour and education were discussed. It was decided to publish the 29 papers as a volume of essays in honour of Adam Smith. During the Madras seminar on November 15, Dr. K. N. Raj, Fellow of the Centre of Development Studies delivered the Commemoration Lecture in honour of the Madras University Department of Economics also celebrating its 60th year, on the theme—Economics and Village Studies. During the Kerala seminar, the Vice-Chancellor of Madras University delivered the two Dr. Ramaswamy Mudaliar Endowment Lectures on the concept of Division of labour of Adam Smith and its application to conditions today. The 3 lectures will be included in the Adam Smith commemoration publication.

UGC Teacher Education Workshop and Library Week :

The UGC Task Force on Teacher Education organised in Madras University at the end of November a workshop of Teacher

Education to consider the implications for teacher education of the new pattern of education, as noted earlier. Its conclusions will be studied by the University Board of Studies in Education for follow up purposes. The 9th National Library week was celebrated throughout the country in November. In the Trivandrum celebrations, the new challenges faced by the libraries in Kerela in view of the new programme of non-formal education was the special point of emphasis. In the celebrations in this State organised by the Madras University library, the need to revive and improve the State's Public Library services was emphasised. On the occasion, there was the release of a handbook on the use of the Madras University library and three bibliographies. There was also a good and attractive book exhibition.

Futurology and Institute of Traditional Cultures:

The Madras University Teachers Association organised a seminar on urban and rural futures in the country and State as a part of the programme on futurology which the University is establishing. There was emphasis on the need to use the tools of technological forecasting to visualise alternative rural and urban scenarios for the State and the Country, while also concentrating on medium term and long term urban plant, such that represented by MMDA. There was at the end of November a meeting of the Governing Body of the Institute of Traditional Cultures. In fact this was the first meeting of the Board since the Institute was founded 18 years ago. A long term programme of conferences, lectures, seminars and revised formats for its quarterly bulletin were suggested which the Director would follow up.

Resources Centre:

With the financial participation of the Union and State government, the Tamil Nadu Board of Continuing Education established from November 15, a Resources Centre on Non-formal Education which will assist the State government's large and growing programme of Non-Formal Education. The governing body of the Centre met on November 18 and approved its constitution, its 3 departments on curriculum development, training, and evaluation and set forth its priorities as aiding (a) the 41 Non-formal Education centres established in the city, (b) later the 100 centres each established in Tiruchirapalli and Coimbatore districts and (c) the 375 centres being established in the 375 blocks in the State—in the development of curriculum for the centres, training of instructors and monitoring their programmes and projects. The budget for the Centre is Rs. 2 lakhs shared on the basis of 70 per cent by the Union government, 20 per cent by the State government and 10 per cent by the Board. The Governing Body appointed a selection committee to meet early in December to recruit the staff for the centre. An outstanding educator has been recruited as a consultant to the centre.

1977 Seminar Programme:

The Membership and Seminar Programme for 1977 were established by the Monthly Seminar in November 1976 as under:

	Name	*Subject*	*Residence*
1.	C.M. Abraham	Sociology	Tirupathi
2.	M.S. Adiseshiah	Economics	Madras
3.	M.S. Appa Rao	Management	Madras
4.	B. Ardhanareeswaran	Social Science	Madras
5.	M.V. Arunachalam	Business Management	Madras
6.	Rev. A. Devasia	Economics	Madras
7.	A. Joshua	Education	Madras
8.	T.S. Jayakar	Public Administration	Madras
9.	K. Jhaveri	Human Science	Pondicherry
10.	V.C. Kulandaiswamy	Technology	Madras
11.	C.T. Kurien	Economics	Madras
12.	T.C. Mohan	Economics	Madras
13.	J.P. Naik	Education	New Delhi
14.	C.L. Narasimhan	Economics	Madras
15.	M. Srinivasan	Economics	Madras
16.	T.V. Natarajan	Political Science	Madras
17.	R. Nityananda	Management	Madras
18.	S. Nityananda	History	Madras
19.	K.K. Pillai	Social Science	Madras
20.	S. Patankar	Education	Madras
21.	S. Pothan	Law	Madras
22.	P.V. Rajkumar	Economics	Coimbatore
23.	A. Ramakrishnan	Science	Madras
24.	S. Ramanathan	Sociology	Madras
25.	Ramanujam	Economics	Madras
26.	Basu John	Technology	Madras
27.	M.N. Rao	Business Management	Madras
28.	M.R. Santhanam	Economics	Madras
29.	V. Shanmugasundaram	Economics	Madras
30.	R. Sundaresan	Education	Madras
31.	R. Venkataraman	Planning	Madras
32.	T.S. Venkataswami	Economics	Madras
33.	L. Vedapuri	Adult Education	Madras
34.	V. Rengarajan	Economics	Madras
35.	T.S. Devadoss	Philosophy	Madras
36.	S.C. Joseph	Economics	Madras
37.	A. Krishna Rao	Economics	Madras

	Name	Subject	Residence
38.	Sethunarayanan	Technology	Madras
39.	G.M. Andavan	Planning	Madras
40.	J. Ramachandran	Political Science	Madras
41.	R.T. Narendra	Electronics	Madras
42.	Y. Shanmugasundaram	Economics	Madras

1977 MONTHLY SEMINAR PROGRAMME
THEME : SIXTH PLAN PERSPECTIVES—TAMIL NADU

	Subject	Author	Chairman	Date
1.	Tamil Nadu Economy —1976	A. Devasia	R. Venkatraman	Thursday 27th January.
2.	An Approach to the Sixth Plan	C.T. Kurien	K.K. Pillay	Thursday 24th February.
3.	Agricultural Perspectives	M. Srinivasan	R. Ramanujam	Thursday 31st March.
4.	Educational Perspectives	B. Ardhanareeswaran	R. Sundaresan	Thursday 28th April.
	NO SEMINAR IN MAY			
5.	Social Development Perspectives	C.L. Narasimhan	S. Ramanathan	Thursday 30th June.
6.	Industrial Perspectives	S. C. Joseph	M. V. Arunachalam	Thursday 30th July.
7.	Ecology and Demographic Perspectives	V. Shanmugasundaram	J. Ramachandran	Thursday 25th August.
8.	Science and Technology Perspectives	Basu John	A. Ramakrishnan	Thursday 29th September.
9.	Employment Perspectives	A. Krishna Rao	T.V. Natarajan	Thursday 27th October.
10.	Women in the Sixth Plan	Y. Shanmugasundaram	R. Nityananda	Thursday 24th November.

11.	Rural Development Perspective	T. C. Mohan	R.T. Narendra	Thursday 29th December.
12.	Tamil Nadu Economy	C. T. Kurien	T.S. Venkataswami	Thursday 26th January 1978.

Heads of Department Meeting:

The Sixth meeting of the Heads of Social Science Department of the Southern Universities was held in the Institute on December 11th and 12th 1976. Members present were:

1. Dr. Malcolm S. Adiseshiah
Vice-Chancellor,
University of Madras
Chairman

2. Prop. S. C. Joseph
Head of the Dept. of Economics,
University of Madras,
Chepauk, Madras.

3. Dr. C.T. Kurien,
Prof. and Head of the Dept. of Economics,
Madras Christian College,
Tambaram, Madras.

4. Dr. T.E. Shanmugam,
Prof. & Head of the Dept. of Psychology,
University of Madras,
Chepauk, Madras.

5. Dr. K.H. Cheluva Raju,
Prof. & Head of the Dept. of Political Science,
Bangalore University,
Janna Bharathi, Bangalore.

6. Dr. G. Ram Reddy,
Director,
Southern Regional Centre,
I.C.S.S.R.,
Osmania University Library,
Hyderabad.

7. Dr. N.S. Iyengar,
Prof. & Head of the Dept. of Economics & Applied Econometrics,
Osmania University,
Hyderabad.

8. Dr. John D. K. Sundarsingh,
Prof. of Economics,
University of Madurai,
Madurai.

9. Dr. A. Ramaswamy,
Prof. & Head of the Dept. of Economics,
Annamalai University,
Chidambaram.

10. Dr. M.V. Pylee,
Prof. of Management,
School of Management,
University of Cochin,
Cochin.

11. Dr. Gopala Sarana,
Prof. & Head of the Dept. of Anthropology,
Karnatak University,
Dharwar.

12. Dr. C.B. Tigadi,
Prof. & Head of the Dept. of Economics
Karnatak University,
Dharwar.

13. Dr. V. Rajagopalan,
Prof. & Head of the Dept.
of Agrl. Economics,
Tamil Nadu Agricultural University
Coimbatore.

14. Dr. G. Parthasarathy,
Dept. of Applied Economics,
and Co-operation,
Andhra University,
Waltair.

15. Dr. P.D. Mahadev,
Director,
Institute of Planning,
University of Mysore,
Mysore.

16. Dr. Subba Reddy,
Prof. of Anthropology,
University of Madras,
Chepauk, Madras.

17. Prof. B. Sarveswara Rao,
Fellow,
Madras Institute of Development
Studies, and Emeritus
Prof. of Economics,
Andhra University,
Waltair.

18. Dr. Oommen,
Prof. & Head of the Dept. of
Economics,
Calicut University,
Calicut.

2. Introduction:

The Chairman welcomed the Social Scientists to this Sixth Meeting and pointed to the possibilities for university social sciences development during the coming year as a result of:

(a) the prospects of financial resources for the Universities being larger in the last 2 years on the Fifth Plan,

(b) the establishment of 2 new Universities in our region (Kakatiya and Nagarjuna in Andhra Pradesh),

(c) the launching of 5 autonomous colleges by one of our Universities and the opportunity for renovation of the social sciences curriculum,

(d) the rural ancillaries introduced at the first degree level,

(e) the semesterisation of the courses, the move to help students to apply their theory to social problems and the restructuration of the examination system and

(f) the need to remodel the first degree course comprehensively in view of the launching of the New Pattern of education and the fact that 90 per cent of our students terminate at the first degree level. There is thus a new opportunity and challenge to all of us social scientists to build theories arising out of our environment.

The meeting recorded its deep sense of sorrow at the death of Prof. Naneker, Nagpur University, who has been associated closely with the members present. His professional and endearing human qualities were recalled.

The meeting recorded its profound sorrow at the death of Nawab Ali Yavar Jung who had served the University world ably and faithfully at Osmania and later at Aligarh.

3. Item 1

The Agenda was adopted as follows;

(1) Approval of the Draft Agenda—Doc. V SS/1.

(2) Social Science teaching and research in the Universities—Doc. V SS/2 (I - XIX).

(3) Follow up of the 3 Methodology workshops. Doc. V SS/3.

(4) Progress of Post M.A. course on Research Methodology—Doc. V SS/4 I-VII.

(5) An assessment of the three Inter-disciplinary Research Methodology workshops—Doc. V SS/5.

(6) Work on production of text books Doc. V SS/6.

(7) Approval of records and decisions. Doc. V SS/7.

4. Item 2 and Item 4:

Problems of Teaching and Research and progress of post M.A. course on Research Methodology: Doc. V SS/I-VII.

Dr. C. T. KURIEN : (Prof. & Head of the Dept. of Economics, Madras Christian College) introducing Doc. V SS/2-II, referred to the work on building a new economic curriculum for the autonomous college, work which began 10 years ago with the self-evaluation exercise in 1966 and the problems in conceptualising Indian economic institutions, Indian market behaviour etc., the development of text-books and reading materials in this new area and the retraining of the teachers to handle the new programme. The basic problem is to relate the facts of the Indian economy to economic theory. The new under-graduate course will be developed as a terminal course which it is for at least 90 per cent of the students, while the new post-graduate programme is aimed at developing professionals. There was considerable and wide interest in this reconstruction of the under-graduate and post-graduate economics curricula on the part of all social scientists who raised questions about

(a) Staff preparation,

(b) Student responsibility,

(c) Theory building,

(d) The number of staff needed, and

(e) The risks involved in shifting from the present system of abstract theory to the proposed system of heavy emphasis on institutional and empirical studies.

Dr. SHANMUGAM (Prof. & Head of the Dept. of Psychology, Madras University) introducing Doc. V SS/2-III called attention to the (a) two all India research projects with particular reference to this State, (b) the success of the M.A. programme in the psychology field, (c) the arrangements for making the library available to the students, (d) the need for more work on the first part or the restructured question paper and guidelines for evaluation of community and social service, (e) the problems faced by the lag of the reserved category students, and (f) the need for teachers candidates taking their work seriously at Ph. D. level.

Dr. PARTHASARATHY (Prof. & Head of the Dept. of Co-operation and Applied Economics, Andhra University) introducing Doc. VSS/2-IV, referred to the historical origins of the programme in Applied

Economics and Co-operation and its recent development, where the system of evalution is completely internal, ending with the comprehensive, where external examiners are used. The problem of complete internal evalution needs review. The bridge between field training and theory is being developed for which the project report at the end of the course is a good instrument. The heavy workload of the semester on the teacher which does not allow time for research is a problem faced by all Universities and needs attention at the UGC level.

Dr. SUBHA REDDY (Prof. & Head of the Dept. of Anthropology, University of Madras) introducing Doc. V SS/2-V, called attention to the problems of growth in the reconstituted department. The need for adequate financial provisions for back numbers of journals as well as books for newly established departments is one that UGC should pay special attention to.

Dr. RAJAGOPALAN (Prof. & Head of Dept. of Agricultural Economics, Tamil Nadu Agricultural University, Coimbatore) introducing Doc V SS/2-VI, reported on the experience of the trimester system and the special programme of training for staff. The Department is building with the help of a Ford Foundation grant a good library in agricultural economics.

Dr. SUNDARSING (Prof. of Economics, Madurai University) introducing Doc. V SS/2-VII, reported on the two undergraduate programmes in economics and the introduction of job-oriented courses in the M.A., and M.Sc. degrees. The M. Phil. programme serves both teachers and students on a full-time basis. There are also the M.Litt. and Ph.D. programmes.

Dr. PYLEE (Prof. of Management, Cochin University) introducing Doc. V SS/2-VIII, called attention to the new semester programme for part time M.B.A. students which is over a six semester period. Also a one semester certificate course in entrepreneural develepment has been successfully introduced. Future plans include a two semester course each in plantation management and tourism management.

Dr. GOPAL SARANA (Prof. of Anthropology, Karnatak University) introducing Doc. V SS/2-IX, reported on the semesterisation of the M.A. (Anthropology) programme with five courses in each semester and the problem of internal and external terminal examinations. The use of single valuation for the M.A. degree in the University is now operative. Field work is an essential part of the anthropology course. There is need for some liberalisation of the number of Ph.Ds. which a guide can supervise.

Dr. OOMMEN (Prof. & Head of the Dept. of Economics, Calicut University) introducing Doc. V SS/2-X, referred to the development of this new department and the experience in the critical approach being used in the curriculum. Two specialisations are being developed—economics of forestry and economics of transportation.

Dr. RAMASWAMI (Prof. & Head of the Dept. of Economics, Annamalai University) introducing Doc. V SS/2-IV, reported on the semesterisation of the B. A. economics course and the M.A. course with an intake of over one hundred students each year. The semesterisation of the M.A. course is now being planned and also the M. Phil. course for the future.

Dr. MAHADEV (Dept. of Geography, University of Mysore) introducing Doc. V SS/4-IV, reported on the semester system along with the credit system in operation in the University and in his department. The evaluation is entirely internal. Like Annamalai, there is also a dissertation for the M.A. course. The semester courses are time-budgetted. A diploma course if continued for 4 semesters can lead to a degree. The new course on environmental planning is now under review.

Dr. TIGADI (Prof. & Head of the Dept. of Economics, Karnatak University) introducing Doc. V SS/2-XVI, referred to the UGC workshop on restructuring the courses which has been put into operation in the M. A. degree programme in the University. There was discussion as to the number of courses in each semester which at present number 4. Mathematical economics and statistics have been introduced as optionals in the M.A. course.

Prof. JOSEPH (Head of the Dept. of Economics, University of Madras) introducing Doc. V SS/2-XI, reported on the shortages of staff that the new M.A. semester programme faces in his department and the creating of an environment for reading and study by the students. If this were done all students including those from the reserved categories would be actively engaged in reading and library use. The Common Board of Economics between Madras and Kerala Universities has now been functioning for one year, and the general feeling was that the Common Board cannot deal with the specific academic problems and curriculum developments which each university faces. In addition there are personality and institutional problems. The consensus was that the Common Board might be replaced by an annual meeting of the Chairmen or one member of the Boards of studies from the different Universities to plan long range curriculum developments.

Dr. N. S. IYENGAR (Prof. & Head of the Dept. of Economics and Applied Econometrics, Osmania University) introducing Doc. V SS/2-XVII, reported on the development of the 2 M.A. streams and the programme and curriculum content of the applied economics and econometrics stream. The curriculum of the M.A. general economics is under study.

Dr. RAM REDDY (Political Science, Osmania University) referred to the semester pattern which raises problems of varying evaluations, inter-institutional rivalries and lack of text-books. The entrance examination for the post-graduate course is successful in selecting for the course those who are competent and motivated. This is a special feature of Osmania. There is a problem of the Telegu medium students who enter the post-graduate courses who are outstanding where substance is concerned but have linguistic problems.

Dr. CHELUVA RAJU (Prof. & Head of the Dept. of Political Science, Bangalore University) introducing Doc. V SS/2-XIX raised the question of short term visiting professors among the Southern Universities to strengthen and enrich the teaching resources of each University. The problem of Kannada Medium is also faced in the University. For the M. Phil. course, the University is experimenting with the common methodology course for all social sciences. The problems of the attractiveness of the M. Phil. course for teachers was also raised.

Conclusions:

On the basis of this exchange of views the following main conclusions emerged: (a) *Semesterisation*: It was noted that as of this year all Universities have semesterised their M.A. programme. This has given rise to certain problems requiring attention.

(i) the teaching load on the professors and readers has increased to the point when they have no time left for research. It is therefore recommended to the UGC and Universities to so organise the semester system that the teacher is either freed from teaching for one semester in 4 semesters to do full-time research or given a one year sabbatical every 5 years.

(ii) It is noted that there are wide variations in the number of courses, the content of courses, and the methods of internal and external assessment in the M.A. programme as between the Universities. It is recommended that the Conference of Southern Vice-Chancellors undertake a study of the effects of semesterisation of the M.A. programme, with a view to introducing a certain degree of uniformity in the number of courses, the content of courses, and the methods of evaluation.

(b) *The M. Phil. Programme :* The M. Phil. programme which now exists in all Universities similarly shows wide variations with regard to the duration, ranging from 18 months to 9 months, as well as in the content and methods of assessment. The place of a dissertation or term paper also needs special attention. It is recommended that the Conference of Southern Vice-Chancellors undertake a study with a view to the M. Phil. programme in the Southren Universities having a common framework as do the M.A. and Ph.D. programmes.

(c) *Visiting Professors* : It is recommended to the UGC and the Conference of Southern Vice-Chancellors that a system of short term visiting professors involving not more than 4 months absence from headquarters be developed between the Southern Universities to enrich their teaching resources.

(d) *Library Grant :* When new departments or courses are started and even for some of the existing departments, it is important that there should be an adequate grant for the purchase of back numbers of journals. It is recommended that UGC make provision for such an adequate grant for the library purchase of back numbers of journals for the newly established social science departments in the Southern region.

(e) *Exchange of New Materials* : In view of the development of new or restructured courses and various forms of reading materials such as work books, readings text-books etc. being used in these courses, it is recommended that the professors concerned exchange this material with their fellow disciplinarians in other Universities.

(f) *Data Bank* : It is necessary that the large amount of raw data collected by Ph. D. students and by research scholars be stored in the University or the Southern Regional Office of ICSSR develop a plan for this storage of the increasing amount of data.

Item 3 :

Follow up of the Three Methodology Workshop : In view of the lack of success in the follow up of the 3 inter-university research projects recommended by the Hyderabad, Mysore and Coimbatore workshops, it is recommended that :

(a) ICSSR establish a post of Research Officer in the Southern Regional Office to help in the execution of the inter-university research projects emerging from the ICSSR sponsored workshops and in the development of research projects by the Universities.

(b) ICSSR provide a research fellow to each social science department in its research work, which quantitatively is at a low level in the Southern Region compared to the other regions.

(c) The Vice-Chancellors of Southern Universities give consideration to providing a small unassigned research grant to the heads of the social science departments, which would stimulate research by the department.

Item 5:

Inter-disciplinary research methodology workshops: Assessment and Proposals for the Future:

There was appreciation and broad agreement with the evaluation of the 3 inter-disciplinary research methodology workshop undertaken by Dr. Kurien in Doc. V SS/5. There was a general feeling that the gains of the workshops were impressive: in bringing together social scientists who do not normally meet: in making social scientists conscious of the problem of poverty in the country: in learning each other's language and methods and tools: and in inducing the scientists to open their minds and disciplines to other disciplines. On this basis it is important to continue this search for multi-disciplinary and inter-disciplinary methods and concepts in relation to the problems facing our country.

It is therefore recommended that a workshop be planned on the basis of:

(a) multi-disciplinary studies which have been undertaken on a specific theme.

(b) participation by a smaller group of scientists and a more limited number of days, and

(c) ensuring a wider diffusion of the results of the workshop.

For the coming year 1977, the workshop should be planned as follows:

Place:	—	Kerala University, Trivandrum.
Dates:	—	May 20-23.
Theme:	—	'Village Studies'.
Documents:	—	Studies completed by Mysore — Geography Madras — Economics Andhra Pradesh — Sociology Kerala — Over all

In addition members are requested to suggest other studies which have been completed. Dr. Subba Reddy is requested to obtain village studies completed by Anthropologists anywhere in India and attach a methodological note.

On the basis of these studies which will be circulated atleast one month before

the workshop, the participants will be requested to concentrate on the methodological problems.

Participants	Economics	— 4
	Sociology	— 2
	Anthropology	— 2
	Political Science	— 2
	Psychology	— 1
	Geography	— 1
	Statistics	— 1
	Education	— 1
	Engineering	— 1
	Health & Home Science	— 1

Resource Persons
Two Dr. K.N. Raj

Suggestions Dr. S.C. Dubey
Dr. A.R. Desai
Dr. Andre Beteille

Item: 6

Work on Production of text-books: Doc. V SS/6 I and II). The work of the Telegu Academy in producing undergraduate text-books in Telegu has been completed. There is a request for producing more than one text-book in each subject. There is need also for postgraduate reference works on which a start is being made in history and political science. In Karnataka, Kannada text-books for P.U.C. are available and text-books for under-graduates have still to be developed. In Kerala the demand for text-books in Malayalam is not an urgent one. In Tamil Nadu, fifteen reference works for the M.A. course in Tamil are being prepared and will be published before July 1977. There is need for developing this programme in Karnataka and Tamil Nadu and for establishing adequate financial remuneration for the authors.

(b) The UGC offers fellowships for the writing up of text-books under the supervision of a teacher. It also offers finances for publishing any learned work by the University and affiliated colleges of social scientists in the Universities, so that they are not unutilised as at present.

(c) The absence of publication of text-books and scholarly works by social scientists in the region calls for their organising themselves to undertake this urgent programme, similar to the organisation in Western Universities where teams of teachers produced these books. In the case of economics, it is expected that in the coming years a start will be made in the publications of reading, work-books and work on specific themes and areas of the Indian economy.

University Events:

The Winter session of the Senate was held in November when the decisions of the Academic Council were reported and the recommendations of the Syndicate on programmes, statutes etc. were confirmed. The meeting of the Senate was followed by a meeting of Principals of colleges when the programme of the Integrated Rural Development and the participation of the colleges in it and the problems faced by the Principals in operating the semester system were reviewed. A meeting of the University and the government discussed and agreed upon a schedule of dates of examinations and admission tests for the professional colleges. A further meeting for upgrading the Madras Medical Colleges and linking it with the Post-Graduate Institute of

Basic Medical Science was held in November as noted earlier. Plans for the publication of Tamil M.A. History text-books were established in November to start the M.A. Tamil stream in history in 1977-78. The NSS were mobilised along with other students for a cleaning campaign of the flood affected areas in the city on December 3-5. The syndicate had its monthly meeting and decided on a number of programmes and projects.

December Development Seminar:

The paper for the Madras Development Seminar in December, 'Urbanisation' by Dr. Kulandaiswamy, Director of Technical Education, Madras, together with a summary of discussion of the paper held on Friday December 24 under the Chairmanship of Dr. T. C. Mohan, Professor and Head of the Department of Economics, DRBCCC Hindu College, Pattabhiram appears as the first article.

Second Article:

A paper, 'Science in the Battle Against Poverty', appears as the second article.

'URBANISATION'

By
Dr. V. C. KULANDAISWAMY
Director of Technical Education, Tamil Nadu

1. GENERAL

City building is as old as civilisation. Some of the ancient civilisations had human settlements with well planned lay-outs and service facilities which we associate to-day with urban development. The Middle East, India and China have traditions of city building that go back to 3,000 years from to-day. The vivid description of Kaverippoompattinam, Madurai, and Vanji in Tamil literature gives one a glimpse of the extent to which planned development of cities and provision of necessary facilities had progressed in this part of the world, nearly 19 centuries ago.

Notwithstanding the long history of city building during the river valley and agricultural civilisations, it may be stated that the foundation for urbanisation in the modern sense of the term was laid only in the 18th century. Since then there has been a gradual progress. The tempo of urbanisation accelerated after the second world war. At the beginning of this century, the urban world consisted, among others, of just 19 cities with a population of more than a million. By 1950, this number grew to 75 and in the next 25 years, it rose to 162. In a sense urbanisation as a major problem is a phenomenon of this country. The spurt and speed of growth have baffled planners and decision makers and have defied both regulation and control.

2. CATALYST FOR URBANISATION

The momentum behind urbanisation and the forces that draw people to the cities are complex. However it is closely linked to industrialisation. It is a natural and irreversible bye-product of the process of Industrial development. One does not come across a rural society that is highly industrialised. An elaboration of the correlation between urbanisation and industrialisation at this point is in order.

Economic prosperity depends on resource utilisation. Industrialisation is but resource utilisation. The environment favourable for creating and pooling the necessary components namely trained man power and technology is to-day in large population centres.

Broadly classified, resource utilisation has three sectors of industry, i.e. primary industry consisting of agriculture, mining and dairy farming; secondary industry consisting of manufacturing of heavy machinery and light goods and tertiary industry consisting of producing consumer goods and services.

The primary industry can thrive even in a scattered settlement. The secondary industry which depends on trained man-power and technology needs some concentration of people. The tertiary industry depends on the size of population and generally thrives in large population centres.

Areas where secondary industry and tertiary industry are nourished, have potential for accelerated population growth. If the proportion of tertiary industry is higher in any urban area, it is an indication of potential for in-migration.

Urbanisation therefore is linked with industrial growth and economic development. It was stated earlier that the number of cities with a population of more than a million grew from 19 in 1900, to 75 in 1951; and to 162 in 1971.

The industrial output which rose hardly by 5 per cent from 1900 to 1950, rose by 300 per cent in the period from 1950 to 1975. In a developing country like ours, urbanisation is neither undesirable by itself, nor can it be avoided when we move towards further industrialisation. The problem is one of direction, regulation and control exercised in a manner that the unending massing of human beings does not lead to undesirable consequences. Compared to the percentage of urbanisation in advanced countries, India is still in the beginning stages. The urbanisation levels of some of the advanced countries are given below for comparison with India.

Australia	1933	64.0
	1961	81.9
Belgium	1920	57.3
	1947	62.7
Canada	1921	49.5
	1961	69.6
Denmark	1931	43.2
	1955	69.0
United Kingdom		
England	1921	79.3
	1961	80.0
Scotland	1921	77.3
	1951	82.9
France	1921	46.4
	1954	55.9
Japan	1920	18.1
	1960	63.5
Netherlands	1920	18.1
	1960	63.5
Norway	1920	29.6
	1961	32.1
Sweden	1920	29.5
	1961	51.9
Switzerland	1920	27.6
	1960	41.9
USA	1920	51.2
	1960	69.9
USSR	1929	17.9
	1959	47.9
West Germany	1939	70.5
	1961	76.8
India	1921	11.12
	1971	19.87

3. PROBLEMS OF URBANISATION

Intuitively, we do understand the problems of urbanisation. We associate urbanisation with slums, traffic congestion, atmospheric pollution and certain trends of sociological transformation These are apparent and well organised. However we still do not really have a full grasp of the long term effects of urbanisation.

In the past, urban agglomeration changed gradually and therefore even without significant effort on direction and regulation, a balance was established and perturbations were minimal. As stated earlier *the problem today is not just the migration, but at the rate at which it is taking place.* In a decade, a city changes beyond recognition, and this is the problem of developing countries.

The rate of increase in urbanisation is higher in 'developing countries', which have less capacity and awareness to maintain urban agglomerations. In 1950, one out of every six persons in developing nations lived in urban areas; it is expected that by 2000, the share of urban residents will be about one in two. *This process certainly is much more rapid than what the developed nations had to face during comparative stage of economic growth.*

It was seen earlier that urbanisation is linked to industrialisation. We are aware that industrialisation does not take place without planning. The urban problem mainly arises out of the failure to link migration of population with development efforts and the consequent absence of adequate measures to predict and provide for this transformation. Unchecked and unregulated migration has been the cause of the many problems that the developing nations witness in their urban scene today. The following observation of the Ford Foundation team which came to Calcutta to review the Master Plan is incidative of the problems that the developing countries face and may continue to face in this regard : 'The Plan deals with a city in a state of crisis. We have not seen human degradation on a comparable scale in any other city in the world. This is a matter of one of the greatest urban concentrations in existence rapidly approaching the point of breakdown in terms of its economy, housing, sanitation, transport and essential humanities of life. If the final breakdown were to take place it would be a disaster for mankind of a more sinister sort than any disaster of flood or famine. It would be a confession of failure, at the first major confrontation of mankind's ability to organise the vast, rapidly growing urban concentrations into which humanity seems inevitably destined to move'.

4. URBANISATION IN INDIA

4.1 Definition :

One understands easily the phenomenon of urbanisation in general. A qualitative description is easy. However, the problem arises when a quantitative criterion is to be fixed. A universal criterion does not seem to exist. The definition adopted for an urban area during the 1971 census of India is as follows:

1. All places with a Municipality, Corporation or Cantonment or notified Town Area.

2. All other places which satisfied the following criteria:

   i. A minimum population of 5000.

   ii. Atleast 75 percent of the male working population was non-agricultural

   iii. A density of population of atleast 400 per sq.km.

On the basis of the above definition, towns have been classified into six categories as follows:

Class I	Population 100,000 and above
Class II	Population 50,000—99,999
Class III	Population 20,000—49,999
Class IV	Population 10,000—19,999
Class V	Population 5,000— 9,999
Class VI	Population less than 5000, but possesses urban characteristics.

It is felt that the census definition of an urban area is based on a few empirical tests which do not fully reflect the urban characteristics of an area. In a study of the 1961 census, Ashish Bose* has shown that only 60 percent of the towns classified as urban satisfy the empirical tests regarding density, size of population and character of working force. It may be proper to assume that the estimate of urban population in India is somewhat liberal and a rigorous test might bring down the number considerably. A working group of the Task Force on Urban Development constituted by the Tamil Nadu Planning Commission has felt that towns falling under classes 1 to 3 alone may be considered truly urban**. The approach of the Tamil Nadu Planning Commission seems to be closer to the definition which is in wide use in international research***.

4.2. Growth of Urban Population

Urban population in India has been growing fast. The rate of growth can be seen from Table I.

TABLE 1

GROWTH OF URBAN POPULATION IN INDIA

Census Year	Number of Towns	Total Urban Population. (in million)	Percentage of Urban Population to Total population	Percentage of growth in the urban population
1901	1,888	25.8	10.8	—
1911	1,875	25.9	10.3	0.3
1921	2,012	28.1	11.2	8.3

* Urban characteristics of Towns in India—A statistical study: Journal of II PA—Vol. XIV No. 3, 1968.

** Perspective Plan for Tamil Nadu (1972—1984) : Urban Development Policy. Report of the working group of the Task Force on Urban Development, Tamil Nadu State Planning Commission.

*** World Urbanisation trends—Urbanisation—Development Plans and Policies —U.N., 1968

Census Year	Number of Towns	Total Urban Population. (in million)	Percentage of Urban Population to Total population	Percentage of growth in the urban population
1931	2,145	33.5	12.0	19.1
1941	2,329	44.2	13.8	32.0
1951	2,924	62.4	17.3	41.4
1961	2,461	78.9	18.0	26.4
1971	2,641	108.9	19.9	38.4

Source : Ashish Bose—Studies in India's Urbanisation—1901-1971.

An analysis of the growth of urban population in India reveals certain interesting phenomena. The population in large towns has been increasing more steeply than that of smaller ones. The population of class I towns which constituted 52.41 per cent of the urban population, has shown an increase of 63 percent during 1961-71. On the other hand, class II cities have a percentage increase of 30 and class III about 18 during the same period.* The 1971 census figures indicate that the proportion of population in towns below 50,000 compared to total urban population has decreased from 39.74 percent to 35.44 percent between 1961 and 1971. The figures indicate a rapid urban growth and also the swelling of population in bigger cities at the cost of smaller and medium towns**. The rate of growth of population in the nine metropolitan cities is given in Table II.

TABLE II

GROWTH OF POPULATION IN METROPOLITAN URBAN AGGLOMERATION IN INDIA.

Cities	Population in 1971 in million	Growth rate 1961-71 percent
Calcutta Urban Agglomeration	7.04	19.7
Greater Bombay	5.97	43.8
Delhi Urban Agglomeration	3.64	53.9
Madras Urban Agglomeration	3.17	63.0

* Presidential address by Rama Gowda, 22nd Town and Country Planning Seminar, Institute of Town Planners, India, Bhopal, 1974.

** Report of the working group of the Task Force on Urban Development, State Planning Commission (Tamil Nadu) Nov. 1972 p. 9.

Cities	Population in 1971 in million	Growth rate 1961-71 percent
Hyderabad Urban Agglomeration	1.80	42.5
Ahmedabad Urban Agglomeration	1.74	44.8
Bangalore Urban Agglomeration	1.65	43.0
Kanpur Urban Agglomeration	1.28	31.3
Poona Urban Agglomeration	1.14	44.3

Source : Master Plan for Madras Metropolitan Area, Madras Metropolitan Development Authority, April 1975. p. 9.

The rising trend in urbanisation is expected to continue, and the projected population in urban centres is given in Table III.

TABLE III

ESTIMATES OF URBAN POPULATION: (1971-1986)**

Year	Urban Population	Total Population in millions	Urban Population as a percent of total population
1971	108.9	546.9	19.9
1974	119.9	581.2	20.6
1979	139.5	636.8	21.9
1984	160.2	685.8	23.4
1986	168.8	705.2	24.0

The projection for the period 1971-86 is based on certain assumptions regarding the success of family planning, decline in the overall rate of growth of population and a slowing down in the rate of growth of urban population.

4.3 Basic Infrastructure in Indian Cities

The National buildings Organisation, Ministry of Housing and Urban Development, Government of India has come out with the following statistics regarding availability of certain basic infrastructure in our cities:

** Draft Fifth Five Year Plan, 1974-79, Part I, Government of India, Planning Commission. p. 2

Types of services		Urban population served	
Water supply March 1974	Protected	83 percent	
Sewerage March 1974	Water Borne	38 percent	
Drainage	Complete or Partially covered	36 percent	
Electricity March 1974		86 percent	
Housing March 1971	I. Types of houses		
	i. Pucca (durable)	63.8 percent	
	ii. Semi-pucca (semi-durable)	23.5 percent	
	iii. Kachcha (non-durable)	12.7 percent	
	II. Over-crowding		
	II. 1. Urban centres	Population percentage	Occupancy rate
	i. One room	41.7%	4.6 ppr.
	ii. two rooms	28.1%	2.9 ppr.
	iii. three rooms	13.6%	2.2 ppr.
	II. 2. Cities with over One Million Population		
	i. One room	56.2%	4.9 ppr.
	ii. two rooms	23.0%	2.9 ppr.
	iii. three rooms	10.0%	2.2 ppr.

Note: ppr.—Persons per room. It is estimated that in Metropolitan cities nearly 23% of the population live in slums and squatter settlements.

Source: India, Habitat-76, U. N. Conference on Human settlements, 1976.

The magnitude of the Housing problem is almost baffling. Based on an assessment made by National Building organaization in 1961, and the projection for the subsequent periods, the current housing shortage in urban areas alone is estimated to be in the order of 31 lakhs. Another 31 lakhs of houses are below standard and cannot be considered to be fit. It is reported that the highest incidence of shortage of urban housing is in the low income categories.

Migration constitutes a greater percentage towards increase in urban population, which in turn leads to a number of problems in providing basic infrastructure needed to the society. On the basis of the projected growth of urban population,

additional houses needed for the increase in urban population will be about 12 million by 1986.

5. URBANISATION POLICY

The specialists in the field complain that attention to the problems or urbanisation has been delayed, and even when the enormity of the task was realised, the provision made and steps taken were inadequate. In the first two plans, no specific mention was made about urban planning on any scale. In the third plan, some definite thought was given and the preparation of development plans for 73 urban centres were undertaken. Since then, Master Plans have been prepared for 525 Towns and cities in this country. However, many of these Master Plans have not seen the light. Almost all State Governments are now seized of the problem and increased attention is being given for guiding the urbanisation.

Comprehensive legislation to control urban development has been enacted in various States like Madhya Pradesh, Maharashtra, Andhra Pradesh, Tamil Nadu and in the Union Territories. In 14 other States the legislation is under progress.

The solution of a problem of this magnitude needs a frame work, a well defined policy and guidelines for adoption. The U. N. Conference at Stockholm made a somewhat guarded statement as follows:

> Demographic policies, which are without prejudice to basic human rights and which are deemed appropriate by Governments concerned, should be applied in those regions where the rate of population growth or excessive population concentrations are likely to have adverse effects on the environment or development or where low population density may prevent improvement of the human environment and impede development'.

The Government of India has evolved certain guidelines for urbanisation, which run as follows:

i. Large size cities, especially those with more than one million population, should not be allowed to expand any further. As far as possible new industries and other economic activities which accentuate growth should be located away from these centres;

ii. New urban centres in the proximity of the metropolitan cities should be developed as counter-magnets for migrant population. In order to promote growth in these alternate centres, industrial and other activities are to be channelised by providing initial investments and incentives in the form of land at concessional rates, power, water and other facilities;

iii. New urban nuclei should be planned in resource rich areas to generate growth in those areas. For this purpose, the large industrial towns that have been established during the last two dacadesare being utilised;

iv. The medium sized towns in the population range of 50,000 to

300,000 are to be provided with adequate services and amenities housing and properly laid out industrial estates so that they could attract new growth; and

v. The location of these growth centres are to be chosen within the scope of integrated regional or area development plans.

6. URBANISATION IN TAMIL NADU

The State had in 1971 an urban population of 12.5 million in 443 urban centres which works out to 30.3% of total population as against 19% for the whole country. This indicates the comparatively advanced level of urbanisation in the State. It stands first with respect to the number of urban centres in a State, while it is a little behind Maharashtra (31%) with respect to percentage of urban population. While the total population in Tamil Nadu has doubled in the last five decades, the urban population increased nearly four times. Further, the urban content of population progressed from 15.8% in 1921 to 30.3% in 1971. A consideration of class wise growth of towns shows that the increase is predominant in class I towns, and the class II and class III towns maintain either the same trend or show slight increase. It is surprising that the percentage of population in smaller towns (class IV, V and VI) has decreased substantially indicating that the future prospects and problems of urbanisation will be in the first three classes of towns, i.e. towns having more than 20,000 population. The reason for such a growth may mainly be due to the fact that the larger towns have greater attraction and more people migrate towards such towns rather than choosing the nearby smaller centres. The towns of class I, II and III groups possess better facilities like protected water supply, medical services, schools, colleges etc, compared to smaller units. Almost in all towns which have more than 20,000 population, most of the facilities and services required are found. Therefore the working groups of the Task Force on Urban Development, State Planning Commission (Tamil Nadu) has considered only towns under class I, II and III as truly urban; it is justifiable, also in view of the fact that 78% of the total urban population lives in these classes of towns (Table IV). The rest can be described as semi-urban and are not considered in the discussion that follows.

TABLE IV

PROPORTION OF URBAN POPULATION IN TOWNS OF CLASS I, II AND III (1921-1971)

Category of Town	1921	1931	1941	1951	1961	1971
Class I, II and III	55.3	59.7	60.2	69.8	72.7	78.2
Other towns	44.7	40.3	39.8	30.2	27.3	21.8

Source : Report of the working group of the Task Force on Urban Development, State Planning Commission (Tamil Nadu) November 1972, p. 12.

6.1 Land for Development

On the basis of the projected urban population, it has been estimated that the total additional land required for various land uses will be 1.13 lakh hectares (2.8 lakh acres) by 1984 and 1.77 lakh hectares (4.37 lakh acres) by 1991. This would mean that approximately 9,710 hectares (24,000 acres) of land would be needed annually for urban development.

6.2 Housing

The shortage in housing was estimated in 1971 as 100 houses/1000 population which works out to 9.5 lakhs dwelling units in all the urban centres. The bulk of the shortage would be in the category of the economically backward and low income groups. Taking the future family size as 4.5, it is estimated that the total additional requirement will be 1.2 million and 2 million dwelling units by 1981 and 1991 respectively. This calls for a construction rate of one lakh dwelling units every year to meet the future needs.

6.3 Water supply and drainage

It is estimated that the requirement of water by 1991 may be around 695 mg.p.d. The problem is not merely financial, but is also one of finding sources for the required quantity, since water is a scarce commodity in the State.

Sewerage system exists only in the two municipal corporations of Madras and Madurai and in a few municipal towns. Even here, it does not cover the entire area. It is essential that all the urban centres are provided with underground drainage, if we are to promote their healthy development. The drainage system will have to provide for seven million of present urban population and another 5 million of future growth in urban population.

6.4 Other Facilities

Traffic is a function of land use. The land use pattern should be devised in such a way that the average trip length is minimised. The future urban form should be planned so that it is suitable for providing good and economical public transport facilities. Lack of planning in initial stages of development may lead to costlier solutions at a later stage.

Residential areas should be planned as self contained units with respect to School facilities which include Nursery, Primary and High Schools. The locations should be chosen such that the school trip lengths are kept to a minimum.

Considering medical facilities, it is estimated that about 20,000 beds will be needed in the next 12 years, assuming a standard of 2 beds/1000 population and taking into account the existing shortage which is 10,000.

The efficient functioning of the urban areas calls for a number of other facilities to be provided, chief among which are i. shopping centres ii. recreational centres and iii. public buildings.

6.5 Future Trend

Considering the existing conditions and the policies of the Government and based on the level of infrastructure available, the Task Force on Urban Development, Tamil Nadu State Planning Commission has concluded as follows :

i. Madras City will continue to grow rapidly unless urban centres of

sufficient pull are developed within its hinterland.

ii. The four urban agglomerations of Coimbatore, Madurai, Salem and Tiruchi will continue to be important urban centres and to a certain extent counter-act the overall dominance of Madras urban agglomeration.

iii. Ramanathapuram and Dharmapuri areas would call for development of regional growth centres.

iv. At the micro-level, development of urban focii will be called for in taluks which lack these particularly in the areas mentioned above where they will act as growth points and service centres to surrounding rural areas.

6.6 Urbanisation in Madras Metropolitan Area

Madras Urban Agglomeration had the highest growth rate of 53% between 1961 and 1971 when compared with other metropolitan centres in the same period (Table II). A substantial part of the growth in urban population in Madras is due to in-migration. It is estimated that for the decade 61-71, a major part of migrants came from nearby districts accounting for nearly 28% of the total migrants. Among other States contributing to the city's migrant population Kerala and Andhra Pradesh contributed 9.9% and 9.02% respectively. Of the total migrants to the city, 57% is reported to be from rural areas and a good percentage of this group normally becomes slum dwellers.

7. CONCLUSION

Urbanisation is a process that will continue with economic growth; it has to be guided and controlled for the benefit of the society. The main emphasis has to be on planned efforts being initiated much earlier than the actual occurrence of events.

The problems cannot be solved by looking into the urban areas alone, since it has the main root in the rural areas. Unless rural areas are developed and provided with reasonable utilities, facilities and services, out-migration from rural to urban centres cannot be checked.

Concentration of developmental activities in urban centres will create disturbances in equilibrium and invite more migrants. The major part in solving the problem therefore lies in adopting an approach that would promote the development of a region as a unit rather than isolated centres. Developing urban centres in isolation should be discouraged.

Realising the need for balanced development, the Tamil Nadu Government has taken a correct step in delineating 8 planning regions within the State and development plans are being brought out for Madras - Chingleput, Dharmapuri - Vellore, Salem - Cuddalore, Coimbatore - Nilgiris, Tiruchi - Thanjavur, Madurai, Ramanathapuram and Tirunelvelli - Kanyakumari. It is hoped that these regions under regional Planning Authorities and with the guidance of the Town and Country Planning Board of the State will be able to tackle the problem of urbanisation in a scientific way.

Since Housing acts as the vital link in the urban life, efforts should be made to develop plots nearby with all facilities to accommodate the future growth. HUDCO, LIC and similar public organisations should come forward to enlarge their sphere of activities in house building by providing easy credit facilities at lower rate of interest.

The estimated demand of 1.0 lakh dwelling units per year cannot be achieved by adopting conventional system of house construction. An appropriate technology, equal to the task must be adopted. Use of standardised, prefabricated housing members and encouragement to mass production in whatever manner possible must be given more serious consideration and adopted on a larger scale.

It must also be borne in mind that land is a limited source and is not to be misused or under utilised. It is difficult to retrace, steps in the field of physical development. A careful approach therefore is needed in deciding various land uses and their intensity of development.

Whether one agrees with Plato's description of a City as 'a place where men lead a common life for a noble end' or with *Dante's statement that 'he saw hell in the* city around him', the fact remains that large number of people do migrate to cities every year and this will continue in future. Engineers, Planners and Administrators must face the challenge and strive to build cities that would cater to the needs of the present and future.

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Summary of Discussion

In the discussion of the paper at the seminar held in the seminar room of the institute on Friday, 24th December 1976, under the chairmanship of Dr. T. C. Mohan, Prof. & Head of the Department of Economics, D.R.B.C.C.C. Hindu College, Pattabiram, the chairman observed that the paper provided a wealth of statistical data and comparative figures regarding urban development. The author presenting the paper stated that city building is a part of human civilization. Indian history and classical literature, specially Tamil literature, present an authentic and vivid record of the development of well organised urban communities over 3000 years ago. However, urbanisation in the contemporary sense—the linked development of cities and industry—took place only from the 18th century. Beginning as a gradual process in the 20th century, the growth of cities gathered momentum. Rapid urban growth is a world wide phenomenon starting with 19 cities with a population of over a million at the commencement of the 20th century, 75 cities exceeding this number in 1950 and reaching 162 by 1975 largely due to intensive development of industries. There is a clear correlation between industrialisation and urbanisation. The urban milieu provides the concentration of technology and manpower required

for industrialisation and effective resource utilization essential to the development process, particularly in the secondary and tertiary sectors. Conversely, the primary sector does not need so high a degree of concentration of population. Industrialisation and its concomitant population growth in cities have created serious problems in terms of slums, traffic congestion, atmospheric pollution and certain trends of sociological transformation. The concentration of population in cities in developing countries was one in six in 1950 and is expected to be one in two by 2000 A.D. The urban percentage of 20 in India does not indicate the magnitude of the problem as in absolute numbers India's city dwellers exceed the total population of U.S.A. A universal criterion for defining urban areas does not exist. According to the 1971 Census of India there are 6 classes of towns ranging from those with a minimum population of 5,000 to those with 1,00,000 people and above. The urban population in India has been growing fast with 10.8 percent of its population in urban areas in 1921 to 19.9 percent in 1971—i.e. from 25.8 million to 108.9 million. In the 1961-71 decade the growth of population in Metropolitan Agglomeration has been very steep, with Madras registering a growth of 63 per cent. This underlines the phenomenon of an uneven population growth in the various categories of cities in India, with 63 percent increase in class I towns, 30 per cent in class II and 18 per cent in class III. The rising trend in urbanisation is likely to continue and a projection for 1986, assuming the success of family planning, decline in the overall rate of population growth and a slowing down of in the rate of growth in urban population, shows the total population at 705.2 million and urban population at 168.8 millions. An analysis of the statistics of basic urban services—protected water supply, housing, sewage and drainage and electricity—shows that 83 per cent of urban population in India have protected water supply though at a per capita rate of 15 gallons per day as against the WHO norm of 45 gallons. It also shows a stringent housing shortage. The National Building Organisation estimates it at 31 lakhs of houses with another 31 lakhs below standard. The incidence of shortage is highest for low income categories where pressure from in-migration is maximum. The problems of escalating urbanisation have received no specific attention in the First and Second Plans and a belated attempt was made in the Third Plan to develop plans for 73 urban centres and thereafter Master plans were formulated for 525 towns and cities, though no specific implementation has followed. The need for an urbanisation policy is now fully realised and the development of urban areas in future will be regulated by legislation and policy guidelines at State and Union levels. In Tamil Nadu the urban content of population increased from 15.8 per cent in 1921 to 30.3 per cent in 1971 in 443 urban centres. The State has the largest number of urban centres in the country and ranks next to Maharashtra (31 per cent) in urban population. A noteworthy feature of population trends in the cities and towns of Tamil Nadu is that the proportion of urban population in cities and towns with over 20,000 inhabitants has increased from 55.3 to 78.2 during the years 1921 to 1971, while in the smaller centres there has been a marked decline from 44.7 to 21.8. The population projections for urban areas in Tamil Nadu imply that by 1991, 24,000 acres of land would be needed annually for urban development, one lakh dwelling units will have to be constructed every year and the water

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requirements will be 695 million gallons per day. Sewage systems will have to be extended to towns other then Madras and Madurai. Future strategies for urban development must activate urban centres in the interior to reduce migration to metropolitan areas, regional growth centres will have to be developed in Ramanathapuram and Dharmapuri after due assessment of their potential for the growth of secondary and tertiary sectors and at micro level urban focii in taluks must act as growth points and service centres for the rural hinterland. The solutions to the complex problems of urbanisation require a a systems approach and professional expertise. The Madras University has a course in urban engineering and facilities for research in allied disciplines have to be created on a larger scale. The immediate necessity seems to be the intensive development of the eight regional centres already identified.

During the discussion queries were raised about the function of transport in different patterns of urbanisation and the possible means of checking further urbanisation in cities populated to saturation. Another problem was the influx of undesirable elements together with in-migration of those genuinely in search of employment. Moreover, the role of Small Scale Industries as counter magnets was not clearly visualised. Analysis of urban development in Tamil Nadu clearly establishes that urbanisation is linked with industrialisation. The assumption that small industries could develop alternative centres is not entirely tenable as the latest figures show that 8,000 small industries are located in the first three classes of cities, following infrastructural facilities. The rapid growth of urban agglomerations cannot be contained arbitrarily but by regulation of industrial establishments in the surrounding areas. A significant characteristic of urbanisation in India and Tamil Nadu is the proximity of dwelling and place of work, while in other industrialised countries people live away from their work and commute to the centres of business. The increase of population in areas on the periphery of a city need not cause concern as their industrialisation implies utilization of barren land. In any statistical analysis, rates of urban growth should not be treated as an independent variable. Although in the case of class I-VI towns the rate of increase has slowed down, there does not seem to be a fall in absolute numbers. The development of these categories of towns should receive special attention as they are mediators between country and town and strategic to the annihilation of poverty. The neglect of these has been a major failure in urban planning, an analogy being the public distribution net work in cities with a vociferous populace while scarcities in rural areas were neglected. The view was expressed that historically urbanisation was a spontaneous process and policies for control should be based on control of economic activities. Projections of future trends should aim at greater precision and utilise long range futurological techniques such as scenarios instead of depending solely on unilinear projections. In a reference to migrations it was observed that 70 to 80 per cent of the villagers migrated to cities to earn and then returned their rural habitat. As measures for reducing pressures on metropolitan centres it was thought that dispersal of government offices to the smaller towns would be helpful. Facilities for improved housing in rural areas may also reduce outward migration. In this context, it was queried whether computation of urban population included

seasonal migrants. Reference was made to an interesting interdisciplinary study—the Connecticut River Basin study—carried out by a team of Engineers, Economists and Meterologists to assess environmental impact of industry on air quality, water pollution and translation of population aggregates into output with the existing situation and patterns as the base.

There was general agreement that the present pace of urbanisation warranted intensive interdisciplinary studies to resolve its complex problems. There is also a need for co-ordination of urban development plans with plans for rural growth on a regional basis. The existing correlation between industrial growth and urban development renders it difficult to impose a ceiling on urban population. Whether advances in technology and social organisation will resolve this dilemma remains in the future.

SCIENCE IN THE BATTLE AGAINST POVERTY*

I am proud and grateful for the honour conferred on me by the Gujar Mal Modi Science Foundation in inviting me to deliver the Gujar Mal Modi memorial Lecture for 1976. Sri Gujar Mal Modi, in whose memory the foundation has been established, was throughout his life devoted to the cause of education and research, though he himself was denied the opportunity for higher education. It is fitting that his memory and life are being treasured and continued through the Foundation's activities in the field of Science, of which this lecture is one part and Gujar Mal Modi Ophthalmic Research Centre is the other part. It is, as a tribute to Mr. Gujar Mal Modi's commitment to the higher education and science that I have devoted this year's lecture in his memory to the theme 'Science in the Battle Against Poverty'.

Profile of Poverty

The profile of the poverty of the country and its people has been amply documented. The Fifth Plan document estimates that anything between two-fifths to one-half of our people are living in conditions of absolute poverty. This estimate is based on the nutritional norm of 2,200 calories per capita per day established by Indian Council of Medical Research. If, however, what the Plan document calls the minimum needs of health, housing, clothing as well as food are used as the poverty norm, then the poor constitutes 60 to 70 per cent of our society. In statements made by the Ministers to the Lok Sabha and State Assemblies, these national aggregates of the percentage of those living below the poverty line have been broken down into specific numbers of males and females, living in rural or urban areas by State, by District and in some cases by block. We know who they are and where they are.

Macro-analysis and interpretation of NSS data along with micro-studies of some poverty pockets in each State throw light on other facets of their profile. These include their employment and occupation status or its lack, their assets holdings, positive and negative, and their consumption expenditure patterns. Putting together the data derived from these many sources, the nature of the country's poverty might first be traced.

Our country's poverty is a massive phenomenon. It involves 250 million to 350 million men, women and children living in conditions of absolute poverty as defined above. This means India's poor alone exceed the total population of the 42 independent states of Africa or the 30

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*Extracts from the First Gujar Mal Modi Memorial Lecture by Dr. Malcolm S. Adiseshiah at the Modi Science Foundation, Modinagar, Meerut District U.P. on December 10, 1976.

sovereign states of Latin America and the Caribbean. It is also larger than the total people living in other Asian States, leaving out this sub-continent, Japan and China.

Our poverty is on the increase. One State study[1] shows that in the early sixties both the percentage and absolute numbers of men, women and children who did not have a nutritionally adequate diet declined. But from the middle of the sixties, both the costs of the diet and those who could not afford it increased to the point, where rural poverty in 1970 was what it was in 1960 and urban poverty increased by 10 per cent or nearly doubled during that 10 year period. Similarly, a national study[2] shows that during the same period of the sixties the per capita consumption of the lower 40 per cent of the urban population declined by 15 to 20 per cent and in the poorest 5 per cent of the rural people by one per cent, using the nutritional norms. The absolute number of poor people in the country increased from 220 million to 250 million between 1960 and 1970.

Our poverty is an expression of the inequality and injustice in our society. Poverty by itself is a worrisome but familiar phenomenon to us. The poor are always with us and Gandhiji called us to a sharing of poverty by all of us, demonstrating in his life style a way of life which was an identification with the poor majority that he found around him. In the two decades and a half of planned development since his time, however, we have developed into a society of two cultures—the affluent culture of the minority and the poverty culture of the majority. Within this dualism, our studies show that the rich have became richer and the poor have became poorer. Not only has this happened, but when drafting the Fifth Plan, the Planning Commission built a model to show that during the plan period, if nothing further were done on the distribution side, the lowest 30 per cent of the population will increase its monthly per capita consumption from Rs. 23 to Rs. 26 (the poverty line was Rs. 37), while the top 30 per cent of the society will increase its consumption from Rs. 90 to Rs. 104. It is in this comparative context, that our poverty must be viewed both as a scientific fact of insufficiency and as a moral factor of injustice.

Causes of Poverty

The studies that have been made of our multi-faceted poverty condition throw light on the causes for this condition and these causes can be grouped under three heads.

The first group is structural. We have a society in which the ownership of assets—agricultural, industrial, commercial, real estate and financial—and the incomes derived from them is unequally distributed. The few who own them have high incomes and the majority who do not own them and are in debt to the former have low and declining incomes. This skewed distribution of assets ownership refers not only to minority possession of material resources such as land, corporate business enterprises, machinery,

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[1] Dr. Ramamurthy: Poverty and Supply of Wage Goods in Tamil Nadu: Sangam Publishers, Madras—1974.

[2] M. Dandekar and N. Rath: Poverty in India, Asia Publishing House, Bombay —1971.

commodity stocks, shares and deposits but also to what has come to be called human capital. In the position that we are in this country, the possession of certain kinds of knowledge and skill in the administrative, professional, managerial and scientific areas places their holders in a position *to earn a rental* element in their incomes similar to the rent earned by a landowner or corporate enterprise owner or stock holder. This *unequal distribution* of factor ownership, including highly trained man-power, results in a production structure which responds to the market and distribution system reflecting this group's needs, demands and power of purchasing the resulting products and not that of the poor majority.

A second group of causes is technical. Agriculture, which is our primary industry in the sense that 50 per cent of our national income, 60 per cent of our employed work force, and 80 per cent of our manufacturing industry are dependent on it, has been a stagnant force. Over the five Plan periods, it has registered less than an annual 2 percent compound growth rate which in effect has been cancelled out by an equal population growth, resulting in a zero net growth of this vital sector. It is not that the cultivable area has not been increased during this period. It has increased by more than half and the limits to further opening up of new cultivable lands are now being reached. It is not as if irrigation has not been expanded. Taking all forms of irrigation—major, medium and minor—the area of perennially irrigated land has *during* this period trebled but over 80 per cent of such land only one crop a year is grown. It is not as if now high-yielding variety seeds, chemical fertilisers and pesticides are not being made available, but in spite of their scale neutrality they seem always to reach the well-to-do, the progressive farmer only, leaving the 80 per cent of *small, marginal, dry and drought prone* farmer and the landless labourer out of its ambit. It is not as if the agricultural sector is over-crowded with labour, *causing* unemployment and underemployment, as our Asian neighbours demonstrate a contrasting agricultural work force profile. Japanese agriculture is twice as labour-intensive as our agriculture, and Taiwan, Thailand, and Philippines farming employs 50 per cent more workers per hectare than we do.

Our manufacturing industry shows similar features of low growth. Against the Plan targets of 8-10 per cent over the five Plan period, the secular growth trend of this sector has been less than half of this target at around 4 per cent compound rate. Here again it is not as if investments have been lacking. Over this period Rs. 15,000 crores have been invested in the public sector and Rs. 25,000 crores in the private sector. The manufacturing sector has functioned in a completely protected market and to meet the demands for consumption, intermediate and capital goods of this captive market, the prices of products of most public sector units have been kept low, collaboration agreements for the import of technology and some capital goods have been over-generously *permitted, and various fiscal incentives in* the form of investment allowances and tax rebates have been granted. And yet in the manufacturing sector, capacity utilisation has been around 60 to 70 per cent at the best of times (computing such utilisation on the basis of one shift per 24 hours), more recently the creation of new capacity and new industries tardy and employment generation at a low level.

The problem of employment is a particularly serious one. Over the five Plan periods, the rate of employment creation in the primary, secondary and tertiary sectors of the economy has been below the rate of population increases, and the entry of young workers—now occurring at the rate of 1,20,000 per week—into the labour force. Employment in our economy is not simply wage employment but includes varieties of self-employment and work-sharing, income-sharing arrangements. In terms of the unemployed who were estimated at 21 millions in 1972, or in terms of the underemployed who are computed at one-third of our total working population, and the further refinements involved in applying the concepts of time that a person is available for employment, willingness to work anywhere or only in a given locale, income which is not related to the length of the working day (a gardener who works for 11 hours and is paid Rs. 100 per month vs a research specialist who comes into his room and sits thinking for one hour, jots down some thoughts, destroys it as useless and returns home for the day and is paid Rs. 2,000/- per month) and the productivity of the worker which is a function of many variables, the problem of unemployment has become a key and decisive element in our society. We have the officially documented over 5 million educated job-seekers (from Matriculation to Ph.D.) registered in our Employment Exchanges and above 5,000 scientists, engineers and doctors migrating annually to the affluent countries.

There is also the problem of savings, which in relation to investment are of seven types—that of the public sector, financial institutions, private sector, corporate, co-operatives, house-holds and foreign aid. Two weaknesses mark our savings performance. First, they are in every regard below our targetted levels. The public sector must earn enough in profits to pay its taxes and finance public capital formation to the extent of Rs. 14,965 crores during the current Plan period. There will be a short-fall here. Similarly budgetary surpluses which are a source of public capital formation including balances from current revenues on Union and State accounts and revenues from various funds are also poor. The private corporate sector which is expected to save about 20 per cent of the total savings of the economy can attain this level as its propensity to save keeps in line with its investments through the link between wages, prices and profits. The economy has been a sellers' market so that with real wages remaining more or less constant, profits have been on the rise and the private sectors savings performance on target. But for the economy as a whole, the savings should be 15 to 20 per cent of GNP, instead of its actual 10-11 per cent, for the poverty eradication action to be effective. Second, there is too heavy a reliance on small, fragmented and poverty-dominated house-holds which contribute 80 per cent of the nation's savings, with the public sector and the private corporate sector contributing the other 20 per cent. This is the exact reverse of the savings composition of the affluent countries, where the public and corporate sector contribute 80 per cent and the house-hold sector 20 per cent of the nation's savings. Further our over-reliance on the house-hold sector means that our savings are largely financial, which in real terms is much less when the increased cost of investment now running at 10 per cent is allowed for.

A third group of causes is organisational. Our entrepreneurial supply in both agriculture and industry is limited. While the technological inputs have been increasing in selected regions in the agricultural industry, the scientific managerial inputs have been relatively scarce or in some cases wholly lacking as can be seen in lack of relations between the crops grown and soil composition, the 80 per cent under-utilisation of perennially-irrigated farm lands, the attempts to use scarce fertilisers in dry land farming and the slow start made in mixed farming and conjunctural use of our limited water resources. In the manufacturing sector, family and kinship ties still dominate private sector management with its narrow locational base, while in the public sector the continuing controversy between beauracrats and technocrats for management positions shows that the dimensions of the management problem which is one of development oriented entrepreneurs has not even begun to be understood. More generally our persisting poverty is traceable to our limited skilled labour supply and lack of application of science and technology to overcome the poverty condition. The one thing that we have in abundance is unskilled labour—the second largest in the world, but to turn this bountiful resource into a poverty eradicating force, we need the structural pre-conditions outlined earlier, along with the skilled labour force, and science and technology application that can harness and use it. Our skills producing industry is producing unemployables or migrants. Our science and technology is either lying idle or is working on the same Research and Development programmes as that of the affluent countries. The result is that our industries, including the public sector ones prefer to import their technologies through collaboration arrangements because they are then assured that the imported technology is up-to-date, reliable, and can be safely and speedily used as an input in the industry as it goes on stream. This results in the marginalisation of our Science, and Research and Development programmes whose true vocation is not the pale and ineffective duplication of foreign science and technological research, but the application of science and the development of technologies appropriate to the mass production of essential goods, foodgrains, proteins, edible oils, sugar, clothing, housing, drinking water, mass transport and the intermediate and capital goods that they require.

An opportune time

In the Fifth Plan, we have set ourselves the stark objectives of the removal of poverty from the lives of men, women and children of our country. And we are faced at this moment with a happy and unusual combination of circumstances for making a determined effort to attain that basic objective. The emergency and the discipline that it has brought in our individual and national life and the New Economic Programme popularly known as the Prime Minister's 20-Point Programme can, if honestly, intelligently and comprehensively executed, start the process of structural change which is the pre-condition for the elimination of poverty. We have also during this period brought the forces of hyper-inflation through which our economy passed in the last two years under control. We have had the best foodgrains harvest at 118 million tonnes, enabling us to build a food stock of 18 million tonnes, and all signs are that we will have a repeat foodgrains performance this year. As a consequence rural incomes, at least of the rural rich,

have been raised by some Rs. 2,000 crores and the manufacturing sector is running currently at a 13 per cent growth rate. After some years, our foreign trade has during the past six months registered a trade surplus of over Rs. 40 crores now reduced for the first 8 months to 12 crores and our foreign exchange reserves have attained an all-time high of Rs. 2,500 crores. This is the opportune moment to apply our science and technology in the battle against poverty. In the rest of this lecture, I shall refer to some of the principles that should govern this harnessing of science to the poverty eradication objective.

Science and Technology

Priorities: Science is knowledge, knowledge of resources, natural and man-made, renewable and non-renewable ecological, industrial and human. Technology is the measure of the possibilities of the effective and optimum use of science. Together science as the generator and store-house of knowledge and technology as the instrument for its use, form both the base and motor for the country's development and its decision to remove poverty. Research and Development, (R & D) used as short-hand in this context, stands for scientific research in its knowledge garnering and extending role, pushing back the frontiers of knowledge and clarifying the grey areas and twilight zones, while development stands for technology growing into commercially-viable projects or socially-imperative processes. A first principle that is then derived is that science and technology makes for national development, holistically conceived and is based on the growth and spread of the science and technology infrastructure in the country, through its adult and non-formal education and training programmes, its schools, colleges and universities, its research institutes and laboratories, its demonstration farms and pilot projects and its public, private and joint sector research units. In this principle, the usual useless distinction between fundamental and applied research disappears as well as that between the so-called hard and soft sciences. One shades into the other and each is a parasite on the other, while the basic structural changes referred to earlier call for the use of all sciences and their related technologies—physical, natural, social and human. Further in the social support of science, there is an order of priority implied in this principle. Scientists in the west trace the five main reasons in descending order of priority for the support of science and technology by their societies: they are military, prestige, economic, welfare and science for its own sake. While appreciating and being thankful to them for their honesty and courage in this analysis, and accepting the fact that science priorities are set not by the scientists including economists, but by the country's political processes, I would like to propose to our government and our society that for our country these priorities be reversed and that we place university seience, science applied to the people's welfare, and technology appropriate to the country's agriculture and rural life at the top of the list.

Cost effectiveness : Science and technology makes effective use of our resources. What does effective use mean? To start with it means counting the cost. In military science, attaining an objective at all cost is regarded as both bad economics and bad military strategy. In our economy, resources are limited, and so there are problems of choice, of measuring alternative costs, and of choosing the science

path with full awareness of the cost involved. Beyond this, there is the problem of comparing the costs incurred with the value of the benefit derived—the use of the economist's tool—the production function. Here there are difficulties. While the input costs of a science project can be measured, its output in terms of an invention cannot be predicted, cannot even be defined according to some scientists, let alone identified, weighted and counted. This is a reminder that while production functions involve a probability distribution with wide deviation from the norm, in science and technology expenditures, the output is not really what can be seen. The immediate output will be a scientific paper, a model, a research report, a blue-print or it may be a prototype or pilot plant. But this is only the start of a whole chain that must follow, which economists and engineers call innovation—involving engineering and designing, tooling and manufacturing engineering, manufacturing set-up expenses and marketing set-up expenses. In the invention-innovation chain, only 5 to 10 per cent of the total cost is on the strictly scientific input. This means that a study of the cost effectiveness and the opportunity costs of every science project is necessary along with costing its links in the total innovation chain. Such costs studies rather than spurious cost benefit juxtapositions emerge as a second principle in applying resources to science.

Boundarylessness : The major goal of Fifth Plan is, as noted earlier, the elimination of poverty. This calls for an inter-disciplinary, sometimes trans para-disciplinary, problem-centred approach. At the simplest level it means continuous and constent inter-action of the natural, engineering, agricultural, medical, social and human sciences. At a further level there is the need for the emerging of concepts and use of each others' techniques. The increased production in dry farming areas calls for a combined, even a merged agricultural sciences and social sciences research to produce the suitable HYV technology on the one hand, its speedy and economic delivery to the dry farmer, together with his acceptance of it on the other. The production of new man-made fibre out of bagasse requires not only the use of the tools of chemical engineering but also of market and management techniques both to map the domestic and foreign market and ensure cost effectiveness. The realisation of the targets relating to the reduction and elimination of social inequalities involves the integrated use of research techniques borrowed from sociology, psychology, political science as well as the agricultural and engineering sciences. This integrated use of the sciences for the attainment of stated objectives was demonstrated during the war years as part of the military strategy of the U.S., the U.K. and the U.S.S.R. Its apogee was the Manhattan Project which was the turning point, showing that the time span between research and its application could be significantly shortened, if the critical mass of logistic sciences organisation, man-power and capital resources were used. In our own country, the parallel national objective, the elimination of poverty, calls for a similar disappearing of the boundaries separating the various disciplines, and beyond, the boundaries separating government and science and government and business, along with the deployment of the massive resources—human and financial—of which I see a start in the Integrated Rural Development Programme. A similar integrated effort involving the conceptual

merger and boundariless action is needed in the use of the multipurpose satellite, whether it be for identification of our resource endowments or checking and forecasting weather elements which are the major input in our primary industry, or providing the farmer, the landless labourer and the rural people generally the science tools for their battle against poverty. A third principle which thus emerges is the integrated use of science and the dropping of the boundaries between science and society in battle against poverty.

Autonomy: In this use of science to attain national policy goals, the questions of co-ordination versus separate development, centralization against decentralization, freedom against direction must be faced. In scientific research, we have a plethora of agencies — the Defence Department Research Unit, CSIR, ICAR, ICMR, the Department of Atomic Energy, the Department of Space, ICSSR, SERC, UGC and Universities and the Department of Science and Technology. This kind of scientific pluralism can be a source of wasted resources, disorganised enterprise and duplicated servicing: equally a single monolithic science organisation for our country will be anti-science in the sense that its methods will be inefficient and its decision-making ad hoc and arbitrary. There is need for a co-ordinating body, so that there can be a science policy for the country, which will be a two way amalgam of a technical translation of national policies, goals and strategies in scientific terms, and moulding of these policies, goals and strategies by the potentials and parameters of science. When the Department of Science and Technology was established, I had hoped that it would be the overall science policy organ, but as it has developed its own operational Research and Development Programmes, the development of such an organ at the Cabinet secretariat or the Planning Commission level with the responsibility for deciding on science priorities is the next needed development. There is also the related question for each of the existing science councils or bodies, of their planning their programmes and activities from the top down or from the bottom up. This is a familiar problem which science organisation shares with all other bodies of the modern state which must reconcile the antinomies of continuity of direction with changes in policy and programmes which people and groups demand and need, co-ordinated decision making with initiative in action by the multiple social groups, guidance at the top and autonomy at all other levels. For the science councils and bodies, the rule is clear—within the overall objective of poverty removal and the priorities for contributing to that objective that are established by the Central Science organisation, each council must be a guiding, advising and counselling body and shed its tendency to be a centralising bureaucratic body. For bureaucracy is the alternative to science and centralised constraints the foe of research. Within the centralized research policy, directives, the established priorities and the cost utilisation or effectiveness assessments, the only person who can and should decide what research work should be undertaken and how it should be undertaken is the researcher or the team of researchers. This freedom of the researcher is essential if science is to grow and respond to the national policy objective. There is no such person as a directed researcher because there is no directed research. A fourth principle which emerges is that science policy must be an amalgam of co-ordinated decision-making, based on the autonomy of the individual researcher.

International Dimensions : Science is not only a national asset, and even as it becomes one, it has international dimensions. The history of science in India and in other developing countries is a reminder that the first prerequisite for science to join in the battle against poverty is that it must be and become a native plant. So much of the argument that science is costly, that the poor countries cannot afford it, that the science and technology that they need can be imported at low cost, is based either on applying the lessons of the history of science in the affluent countries to the condition of the poor countries (which is a kindly explanation) or a straight attempt to continue and worsen the state of unequal science relations as part of the inter-national inequity syndrome (which is a harsh intrepretation). I am myself inclined to the kindlier interpretation. Let us not forget that the whole industrial revolution in England was effected without the intervention of science; technicians like James Watt and Arkwright, apprentices like Slater developed industrial inventions, and not scientists. The first Professor of Chemistry in Cambridge was a Doctor of Divinity and the celebrated Davy and Faraday had no place in a University. Teaching experimental science in a university was till 100 years ago regarded as opposed to the University's mission and its men of learning who being of the highest moral character and living blameless lives, would therefore mean "impiety in subjecting the views and conclusions of such worthy men to the test of experiment". It was little over a century ago that the United States dared to include science and scientific research in the University; its attempts were derided as the start not of universities but of cow colleges, who could turn out not gentlemen but uppity farmers. So the sciences as University disciplines, scientific research as a normal function of the university Professor, engineering and technology as academic disciplines are of very recent origin. In the euphoria created by the great achievements of science and technology today, it is well to recall that its entry into the formal education system and its application to solve technical and national problems is not even a century old. This tradition may account for the fact that our science and scientists in India have not till their annual conference this year in Waltair, and a few of them till two years ago in their Karimnagar project, attempted an integrated use of science resources to battle our rural poverty problem. While the industrial revolution of the last century disregarded national frontiers depending on the spread of the technical processes, access to raw materials and a large fund of unskilled labour, their country's scientific revolution demanded a basic national infrastructure of teachers, scientists, engineers, of universities and research laboratories and institutes. For a real attack on our rural poverty, proximity to a university or a complex of science research institutes is more important than access to raw materials and capital resources. Equally science once implanted in a country and growingly applied to attain its policy objectives has international dimensions. What other countries are doing, their science aims and attainments must be known and used as an input in our science policies, along with some awareness of the international repercussions of our science and technology programmes, as became evident in the case both in Pokharan and Aryabhatta. A fifth rule of thumb is for a body of foreign affairs specialists to be constituted as the

international arm of the science policy of the country.

Science Futures: Such are some of the issues involved in our current decision to deploy science in the battle against poverty. In so ordering our technologies, the need to have a clear perspective of our national and science futures against which present decisions are made and programmes undertaken. In so visualising the future, we have to avoid wishful utopion scenarios on the one hand, and what has been called the perpetual present or of timeless time, which are the constraints of the expanded present on the other. In some ways this building of alternative futuristic science scenarios is not so complex for us. We do not have the complexities involved in distinguishing between "big science" and "little science". For us science is still science. Also we do not have the problem of the affluent countries and their exponential growth and mounting cost of science, leading to the conclusion that this science growth must be limited. One such futurist scenario is portrayed thus: "The number of scientists doubles every 12 years, but the cost of research in most Western Countries increased at about 15 per cent per annum, which is five times as fast as GNP is growing....The population of the world may be doubling every 30 years, but if the same law of scientific growth were followed as at present for another couple of hundred years, every man, woman and child and every dog, horse and cat would be a scientist". (3)

Also the scenarios of relative non-scarcity visualised in those countries do not apply to our futures. Even for them there is something utopiac in the scenarios, which set forth the technological battle as having been won, "the victory over scarcity a fact, and the future problem one of redirecting science and technology towards ends which are not given, as was survival amid scarcity, but as ones which must be invented". In these respects our science base and technological present from which we start is less complex and the building of our futuristic science and technology scenarios simpler. On the other hand in so far as we have not really made a start either in visualising our science future or in technological forecasting, our task is more difficult. The futuristic forecasts tn the area of national policy that have been developed by me and some of us envision our moving from poverty to sufficiency by the first quarter of the next century. On the basis of that scenario, it is urgently necessary for us to plan our science future, using the technological forecasting tool. Such technological forecasting will help us to select the research and developmenl programmes now and in the short and medium-term against the long range sufficiency goal. It will also clarify in that manner the Internal science and technology transfer process can be made, and provide the missing links in our science and technology scene of the past and today between research and innovation. This coupling function between science and technology, between invention and innovation, must be realised in light of the future long-range goals. Technological forecasting techniques are now a well-known and accepted methodology—involving the use of the Delphi model, the envelope curve and trend extrapolation techniques, morphological tools, the relevance tree techniques and systems analysis. Technological forecasting will help us to identify areas of scientific research directed to the national aim of removing poverty; it will provide us with a study of alternative

3 Lord Bowden: Science and Public Policy Today. OECD, Paris—1968.

future technologies arising from the research areas which a systems order will enable us to organise chronologically: it will help in the evaluation of complicated patterns of input information and help in choice between alternatives in light of a comprehensive coverage of all factors and the need for some homogeneity of results.

A final thought therefore is the need for us to start visualising our science futures within the frame of our overall national scenarios—the elimination of poverty and the move to sufficiency—and using for this purpose the well-worn tools of technological forecasting, which will also align our science with our society.

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